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THE COMMERCIAL CAR JOURNAL

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PERIODICAL ROOMS

Baker Electric Trucks

THE cost of running Baker Electric Trucks, taken from records kept by hundreds of business houses, averages from $3.07 per day for light delivery wagons to $5.98 for the heavy trucks. Fixed charges, maintenance and pure operating costs are included.

Figure the costs of your horse trucks. Figure them on your gas truck equipment. Compare.

The results will show that Baker truck dependability effects the economy for which Baker Electric Trucks are noted. It should pass almost without argument that of all business concerns Electric Lighting Companies should use Electric Trucks—for "moral effect" as well as economy.

Our Free Book "Why an Electric Truck?"

draws some enlightening fact comparisons between Baker trucks and horse and gas truck transportation. It will interest the man who is looking for greater economies in his business.

Baker Models for all service from 500 pounds up to four tons capacity; also tractors up to eight tons haulage capacity.

THE BAKER MOTOR VEHICLE CO., CLEVELAND, O.

Canada: The Baker Motor Vehicle Co. of Canada, Ltd., Walkerville, Ont.

Makers of Baker Coupes, Broughams, etc.

Represented in principal cities. Applications solicited for representation in open territory

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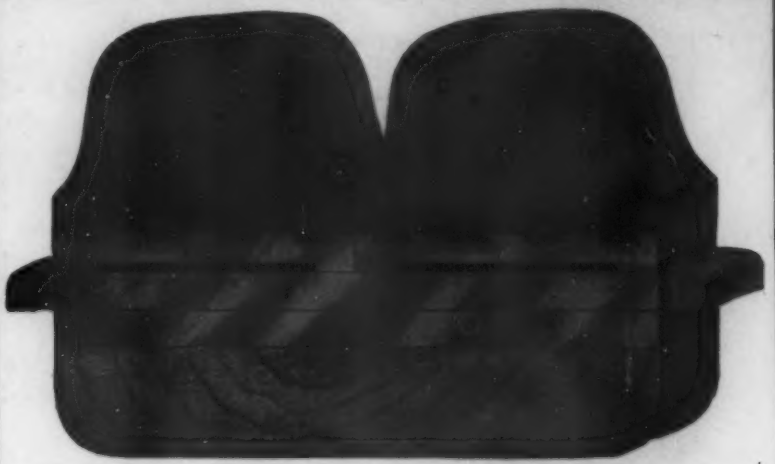

THREE YEARS AHEAD

We were the first to realize the possibilities of the Wireless Tire; the first to perfect it and market it.

While we experimented and demonstrated and our tires were being tested by severe usage, others watched and waited.

When they saw the phenomenal success of our product they realized we had the right idea and started to imitate it—but we were three years ahead. One by one they have entered the field, but we have not stood still—we are as far ahead now as when pioneers. When you want the best you still must ask for

GIBNEY WIRELESS TIRES

GIBNEY exclusive agents are three years ahead of their competitors. They sell the proven success, the most advanced product, the leader in the field. There is money for you in exclusive representation, if you are equipped to properly represent us.

Write for our proposition

GIBNEY

Tire & Rubber Company

Factory: CONSHOHOCKEN, PA.

PHILADELPHIA **NEW YORK**
BOSTON **MINNEAPOLIS**

THE PUBLISHERS' PERSONAL PAGE

"Rust Wastes More Than Use"

Studies of haulage problems show that the average wagon is standing idle fully sixty to sixty-five per cent of the time. While this may be tolerated with horse equipment, as it permits the horse to rest, it is but one of the many reasons why an entirely new system should be installed when commercial motor cars are put in service.

The above saying, "Rust Wastes More Than Use," is unusually true in regard to trucks. Nothing cuts down the efficiency, the earning capacity, and satisfactory service of a truck as the idle time. The question is, then, how can the idle time be eliminated? There are several kinds of idle time, depending upon the nature of the work. Where docks and railroad terminals are frequented, the idle time is often caused by slow-moving horse trucks; also by insufficient loading space, by lack of clerks or system within the freight houses, and often by lack of help when loading. Many of these conditions cannot be readily changed without an entire regeneration of the freight terminal system. The present proposed reconstruction of the docks of New York will be a potent factor in doing away with part, at least, of this trouble in that city.

Delay Due to Driver

There are, however, many delays which are directly due to the procrastinating methods of the driver. These are usually unknown to the man in charge of the delivery system, and are often purposely indulged in when trucks are first installed, especially by horse drivers. These men figure that at about two or three hours before closing time they have already done as much work as they would have done with horses, and therefore, no one will know any better if they take an hour or two off. Other drivers make a regular practice of loafing at certain resorts, knowing that they can drive the truck at high speed and get back at a reasonable hour. These are conditions which can be taken care of very easily by the use of recording instruments, and their use is hereby recommended to every truck user, particularly the new truck user.

"Not Possession, But Use, is the Only Riches"

It is not sufficient that you are a truck user, you must be an intelligent user. Even the truck manufacturers are realizing that the future of the industry depends, not alone upon their ability to build competent machines, but upon the intelligent use of these machines in the hands of the purchaser. Experience is the best teacher, but is very expensive, and not nearly as economical as previously making a special study of your trucking problems by the free use of trade publications devoted to these subjects.

Each issue of *The Commercial Car Journal* has accounts of experiences of direct value to you.

If You Are a User

The old adage that "For want of a nail the shoe was lost; for want of a shoe the horse was lost; for want of a horse the man was lost," applies equally well to modern transportation methods, meaning commercial cars. Trucks cannot be used successfully without an effective maintenance and inspection system. System is not red tape, but the orderly, logical arrangement of correlated work. Trucks must not be operated without oil or with parts loose. Another important element in success is economy, not only of money, but of time. Economy of time is an assured thing with motor trucks, and economy of money is just as much assured by the use of power-driven vehicles, but not without an intelligent system. This requires a knowledge of trucks and truck operation. Moral: Subscribe now to *The Commercial Car Journal*. Subscription price, only $1 per year.

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USED IN EVERY LINE OF BUSINESS

MITCHELL, FLETCHER & CO., INC., PHILADELPHIA, PA.

These Grocers Deliver Promptly With

Autocars

Why Don't You?

FINLEY ACKER COMPANY

Philadelphia, May 5, 1913.

THE AUTOCAR COMPANY,
Ardmore, Pa.

Gentlemen:

We have used AUTOCAR trucks in our delivery service for the past several years and have found them very satisfactory.

Through their use we have been able to cover a greater area and thus increase our sales. Yours very truly,

(Signed) FINLEY ACKER COMPANY.

MITCHELL, FLETCHER & CO., Inc.

Philadelphia, April 30, 1913.

THE AUTOCAR COMPANY,
Ardmore, Pa.

Gentlemen:

In 1910 we purchased two AUTOCARS for use in the suburban districts. We have since added two more to our service, thus displacing about twenty horses. The mileage covered per day averages about fifty miles.

Through the use of the AUTOCAR we are enabled to reach much further distances in the outlying territory that would be impossible with horses. Yours very truly,

(Signed) MITCHELL, FLETCHER & CO., Inc.

E. BRADFORD CLARKE COMPANY

Philadelphia, May 2, 1913.

THE AUTOCAR COMPANY,
Ardmore, Pa.

Gentlemen:

We are very glad to report to you the satisfactory work the AUTOCAR has been doing for us. We have been using them, as you know, for close on to three years. Have been able to extend our deliveries throughout the suburbs, and thus far have had very few delays. The three cars now in use have replaced eighteen horses, and we feel more than satisfied with the results.

In our opinion, the AUTOCAR is THE car for commercial purposes.

Very truly yours,

(Signed) E. BRADFORD CLARKE COMPANY.

HENRY R. HALLOWELL & SON

Philadelphia, May 5, 1913.

THE AUTOCAR COMPANY,
Ardmore, Pa.

Gentlemen:

We have used an AUTOCAR in our delivery department for the past two years and it has given us the most satisfactory results.

It has proven to be a profitable investment, not only because we are enabled to cover a more extended territory, but because the upkeep of the car has been practically nothing at all.

Very truly yours,

(Signed) HENRY R. HALLOWELL & SON.

HENRY ROHNER COMPANY

Philadelphia, May 3, 1913.

THE AUTOCAR COMPANY,
Ardmore, Pa.

Gentlemen:

We wish to say that we have been using one of your delivery cars for a period of three years, and find the same very satisfactory. It is being used for both city and suburban service, and we find we are enabled to cover territory which we thought it impossible for us to reach. We have no doubt that the use of the AUTOCAR has materially increased our business. Very truly yours,

(Signed) HENRY ROHNER CO.

THOS. MARTINDALE & CO.

Philadelphia, May 3, 1913.

THE AUTOCAR COMPANY,
Ardmore, Pa.

Gentlemen:

We purchased two AUTOCARS the latter part of 1911, and have since been running them continuously on our suburban routes.

Prior to this we had great difficulty in reaching many points by horse-driven wagons; in fact, we were unable to give our customers the service that an increasing business requires.

We are pleased to say that by the installation of the AUTOCARS in our service, we have eliminated this trouble, and the benefit to our delivery service is very material. Respectfully yours,

(Signed) THOS. MARTINDALE & CO.

"It is no longer a question of whether your business can afford motor delivery vehicles. The question is, Can it afford to be **without** them?" Replace your old or worn-out horses with AUTOCARS. Then you will be prepared to make uninterrupted deliveries at all times, in all seasons—through all weather conditions, over unlimited distances. There are today more than 900 merchants and transportation companies using the AUTOCAR Motor Delivery Vehicle. They made thorough and critical investigation before purchasing AUTOCARS. Their satisfaction is shown by the fact that **47 per cent of all our sales are repeat orders.** Now is the time for you to equip your delivery service with the **modern method** if you wish to hold your customers and secure your share of the general increase of business.

Write for Catalog No. 5-C—our Body Design Book will be included

THE AUTOCAR COMPANY, Ardmore, Pa.

ESTABLISHED 1897

EVIDENCE OF SATISFACTORY SERVICE:

P.S. On May 7th, 1913, the Adams Express Co. Ordered 36 additional AUTOCARS—their TWELFTH repeat order—THEY NOW OWN 160 AUTOCARS

MOTOR DELIVERY CAR SPECIALISTS

The Commercial Car Journal

VOLUME V PHILADELPHIA, JULY 15, 1913 NUMBER 5

AN EXTENSIVE FUEL INVESTIGATION TO BE MADE

The Automobile Chamber of Commerce, at its recent meeting, requested the Society of Automobile Engineers to appoint a committee and outline a plan for a thorough investigation of the motor car fuel situation, in view of the fact that gasoline has been advancing so rapidly.

The S. A. E. Committee appointed were E. E. Sweet, Cadillac Motor Car Company; C. E. Grimes, Wheeler & Schebler, and N. B. Pope, of Automobile Topics. This committee has reported to the S. A. E. that an appropriation of $20,000 should be made for this purpose, with which to establish a laboratory, equip it properly and employ a trained expert for a year, the idea being to study the value of heavier fuels and the testing out of carburetors designed for their use. The committee recommend that the laboratory be established either at Detroit or Indianapolis.

MOTOR TRUCK CLUB MONTHLY MEETING

The June meeting of the Motor Truck Club was held at the Hotel Cumberland, Broadway and Fifty-eighth Street, on Wednesday evening, June 25th. Considering the warm weather, the attendance was unusually good. The paper of the evening was by C. A. Crane, Secretary of the General Contractor's Association; the subject, "Why Contractors Are Not Larger Users of Motor Trucks." The meeting was preceded by the usual dinner at 6.30. Extracts of Mr. Crane's paper are herewith reproduced.

THE ARMY TO TAKE UP COMMERCIAL CARS ACTIVELY

The United States Government has appointed a Board of Army Officers to make an investigation of motor cars for army use. The Ordnance Department, Coast Artillery, Field Artillery, Quartermaster's Corps and Engineers will all be represented on the board, and various tests will be made to try out the motor cars under varying conditions. Motor cars will be used in the maneuvers of the Second Regiment at Springfield, Mass., this summer for the first time. To give the vehicles a severe test, the commissary depot will be situated twenty-five miles from camp.

HAYES TO MANUFACTURE SHOCK-SHIFTER HUB

Hayes Wheel Company, Jackson, Mich., has decided to manufacture the Muir Shock-Shifter Hub, which is especially adapted for use on commercial cars. The inventor, John Muir, states that this hub has been experimented with by twenty or thirty prominent American car makers, and great claims are made for its value as a shock absorber.

NEW WEIGHT LIMIT BILL PASSES IN MASSACHUSETTS

Governor Foss, of Massachusetts, last month signed the bill of the Highway Commission to regulate the use of the roads of the State by motor trucks and traction engines. The bill limits the weight of any motor truck or traction engine with load to 14 tons, but vehicles in excess of that weight may use the roads if special permits are obtained from the local authorities or other parties having charge of the roads. The bill prohibits further the use of the wheels of vehicles of any ribs, flanges, clamps or other objects that will damage the road surface.

In the towns of the State, outside the Metropolitan parks and sewerage districts, the weight of vehicles and loads is also limited to 800 lbs. per inch width of tire. This permits the use of heavier vehicles in Boston and other cities and in the towns near Boston, and in other places, if there is a pavement of brick, block, sheet asphalt or concrete. The owner of a heavy vehicle is made liable for road damage.

Steam traction engines, with or without trailers, and motor trucks of over 4 tons, are limited in speed to 15 miles an hour, and such vehicles, carrying a weight in excess of six tons, including the vehicle, are limited to six miles an hour, if they have steel or iron tires, and to 12 miles an hour if they have rubber tires. The permits for moving extra heavy loads, authorized in the bill, may be general in character, or may specify the particular roads and bridges that must be used. Speed on any bridge may be limited to 6 miles an hour, if the authorities think it necessary.

The bill carries a fine of not more than $100 as penalty for each offense, the fines so paid to be used on the highways.

ALCO TRUCKS TO HAUL UNITED STATES MAIL

The American Locomotive Company, New York City, has made a sale of eighty Alco trucks to the Postal Transfer Service, Inc., which has the government contract for carrying United States mail in New York City. The trucks are all of the three and one-half ton capacity and are fitted with Standard United States mail bodies. The trucks will handle straight mail as well as parcel post matter.

STRIKE IN THE MACHINE SHOP OF THE ADAMS BROTHERS FACTORY

The employees of the machine shop of the Adams Brothers Company, Findlay, Ohio, went out on a strike because they objected to the speeding up tactics of a new foreman, which the Adams Company brought from Detroit. The Adams Company are replacing the men who went out on a strike as fast as possible.

TEAMSTERS BECOME TRUCK OWNERS

The motor truck has made it possible for many former teamsters and drivers to become independent business men. Many thrifty drivers have bought motor trucks, most of them used cars that could be bought at a low price, and are successfully carrying on a regular cartage business.

In Boston there is an interesting case of two motor truck drivers who formed a partnership, bought a second-hand G. M. C. truck and started in business as jobbing truckmen. They had no difficulty in finding all the work they could handle and do well, but one of the partners sold his share of the truck to his partner at the end of three months, bought a bigger machine and started out for himself.

Ever since the beginning of his venture the truck has been in constant use. He always is able to get orders for more work than he and his helper can do, and besides this, has had several opportunities to make contracts for work covering the entire season if he wants them. He is often called on to take out special orders for concerns that maintain their own delivery system, when these companies have demands that cannot be taken care of by their own equipment which is busy on regular routes.

This new truck owner claims that he is doing very well and is establishing himself, and believes that he is laying the foundation of a good business, the development of which is certain.

His method of caring for the truck, which he keeps at the service station of the General Motors Truck Company, is to examine it each day for possible needs of adjustment, to go over it whenever he has any spare time during the day, and keep it up to as high a standard as he possibly can. He wants the machine to be always ready for use, and if he receives any night or Sunday calls his truck is always ready for business.

As to his driving, he maintains that there is nothing gained by moving fast over poor streets or roads. He says that he drives as he did with horses, favoring the truck where judgment dictates that this should be done, and making time on the good streets and highways. He says that often he could save an hour's time by driving over a short section of very rough ground, but he has preferred to unload the truck and carry the goods the short distance rather than abuse his machine. He says that he will not carry overloads and that in the event of being in sand or soft ground, or where very severe work is necessary to move or get out of the hole, he will use boards, brush, or whatever will give the wheels traction.

The two men referred to operate their own trucks, each employing a helper, and have no difficulty in finding all the work they can do, at prices that are satisfactory. The charge for the trucks is about $2 per hour, according to the nature of the work; and as this includes the service of two men, it cannot be regarded as excessive. Very often work is undertaken at a job price, and of course this cannot be estimated on an hourly basis. Jobbing haulage has been carried on with animals for years, but men engaged in this kind of work would seem to regard the ownership of a truck as something quite beyond them.

The experience of these two men, however, would seem to indicate that there are abundant opportunities for energetic drivers to establish themselves and to secure constant and desirable patronage from firms that are willing to pay for whatever special service they need, rather than maintain extra delivery equipment that might not at all times be utilized to its full capacity.

FORD SEMI-TRAILER

1. In using a Ford chassis for delivery purposes which is the most feasible plan? to build a double deck body directly on the chassis with a small trailer to handle excess load, or to construct two-wheel trailer with wheels at center of body so that load will balance on same, relieving car of any load and with body high enough over rear wheels of car to allow a pivoting connection on chassis just back of the gasoline tank; or whether, in latter case, to so place wheels of trailer further back and let car take part of the load. The idea in connecting near the tank is to shorten distance over all. Should the pull of trailer be on the frame of auto chassis or on the axle?

2. Have you any tables of cost of operation of small trucks of 750 to 1000 lbs.; also comparative table to horse and wagon operation on close in delivery with numerous stops?

3. Where can I get light rubber tired roller or ball bearing wheels suitable for trailer?

HANFORD, CAL. F. V. CRAIG.

Without knowing what commodity you intend carrying or the nature of the roads over which you operate we can only answer your queries in a very general way. The construction of your chassis will not permit of any but moderate light loads and the trailer idea will probably prove best in the long run. If you pivot the forward end to a fifth wheel or turntable similar to horse vehicles the pin or king bolt should be forward of the rear axle of the chassis about 2 to 3 in., otherwise you will experience difficulty in turning or backing, but as you may find this form of coupling your trailer will be prevented by the seats and tank, you may have to resort to a draw bar connection at the rear end of chassis.

As the axle housing may become bent or strained through direct connection between it and the trailer, we recommend your attachment being fitted to rear end of frame. This form of connection will necessitate the load being very evenly balanced by placing the trailer wheels under the center of your load.

Nearly all of the manufacturers of motor vehicles can supply comparative operating cost data and we suggest your communicating direct with our advertisers for complete information. We know of no one supplying the kind of wheels you wish other than the motorcycle makers possibly and believe the best way for you to get what is wanted is by interviewing your local bicycle or garage man who may fit you out from some old vehicles on hand.—*Editor.*

New Gray & Davis Plant in Course of Construction at Cambridge, Mass.

This plant will be five stories high, 381 ft. 6 in. long, by 81 ft. wide on the first floor and 61 ft. above that, and will allow of future additions and a power house. Reinforced concrete will be used throughout, while the facing will be a tapestry brick veneer. The first floor will include a large showroom, while the offices will be on the second floor, occupying the full width of the building. The factory proper will be modern in every respect. Electrical power will be used entirely and will eventually be generated in the power plant to be erected later on.

Personal Items

Leicester F. Benton, president of the L. F. Benton Company, Vergennes, Vt., died recently.

G. H. Perry has been appointed business manager of the Alma Motor Truck Company, Alma, Mich.

W. A. Early has been appointed manager of the Pittsburgh, Pa., branch of the Motz Tire & Rubber Company.

W. H. Flynn has succeeded R. H. Hutchinson as advertising manager of the International Motor Company.

George E. Shaw, well known to the automobile trade, has joined the Technical Staff of the Emil Grossman Company.

D. E. Marriott has joined the Goodyear Tire & Rubber Company, Seattle, Wash., and will handle truck tires exclusively.

R. S. deMitkiewicz, formerly with the Peerless Motor Car Company's truck Department, is now with the American Locomotive Company.

Arthur O. Smith, president of the A. O. Smith Company, Milwaukee, Wis., manufacturer of automobile parts and trucks, died on June 19th, at the age of 54.

C. A. Hamilton has resigned the vice-presidency of the Lavigne Gear Company, Racine, Wis., and is developing some ideas of his own in cycle cars.

George H. Bryant has resigned his position as advertising manager of the Locomobile Company of America, to accept a similar position with the Velie Motor Vehicle Company.

R. J. Johnson, formerly with the Garford and Gramm Companies, has been appointed superintendent of the Bowling Green Motor Car Company plant at Bowling Green, O.

Norman H. Halliday, formerly with the Thomas and Packard Companies, has been appointed manager of the International Motor Company's New England branch, at Boston, Mass.

J. E. Kirchner, formerly with the Kelly Motor Truck Company, has been appointed chief engineer for the Mogul Motor Truck Company, which recently removed from Chicago to St. Louis.

J. F. Gfrorer has been promoted to the position of manager of the Alco General Service Department, which now embraces the service of branch houses and the dealers' service department.

B. F. Schmidt, formerly foreman of the Speedwell Motor Car Company, Dayton, Ohio, has been promoted to the position of superintendent, succeeding Mr. Dunston, resigned.

C. A. Swinehart, formerly with the Swinehart Tire & Rubber Company, has acquired an interest in the Vulcan Rubber Company, of Erie, Pa. This company will manufacture a commercial car tire of Mr. Swinehart's design.

L. A. Austin, general manager of the Mais Motor Truck Company, Indianapolis, Ind., has resigned that position. He has no definite plans at the present time, and can be reached at his residence, 210 Medbury Avenue, Detroit, Mich.

W. N. Hogle, of Detroit, formerly connected with the Alden-Sampson Company and later with the Sheldon Axle Company, has become sales manager of the Alma Motor Truck Company, and will make his headquarters in Detroit, opening a salesroom in that city.

E. M. Denton has succeeded C. K. Thomas as district manager of the Chase Motor Truck Company. His territory will comprise the greater part of the Southwest and he will make St. Louis his headquarters. Mr. Denton was formerly Chase agent in Baltimore, Md.

John Calder, vice-president of the International Motor Company, has been elected to the presidency in place of C. P. Coleman. Robert E. Fulton has been promoted from fourth vice-president to the position of first vice-president. F. R. Phillips, who has been general manager of the Saurer and Mack factories, has been made assistant to the president.

Trade Changes and Factory News

Smith, A. O. Company, Milwaukee, Wis., has discontinued its Chicago salesrooms.

Hess Spring & Axle Company, Carthage, Ohio, has increased its capital stock from $100,000 to $350,000.

Day Utility Car Company, Detroit, Mich., has secured financial support in Spokane, Wash., and will remove its plant to that city.

The American Can Company, of Detroit, Mich., will manufacture radiators under license from the Mayo Manufacturing Company.

Chase Motor Truck Company has opened a direct factory at 279 Halsey Street, Newark, N. J. B. M. Westerman, district manager, is in charge.

Commercial Motor Sales Company, Cincinnati, O., has been taken over by the Commercial Motor Car Company, which has a capitalization of $50,000.

Saurer Motor Company has purchased plant of the Manganese Steel Safe Company, West Front Street, Plainfield, N. J., and will enlarge its automobile truck plant.

Findeisen & Kropf, manufacturers of the Rayfield Carburetor, have removed their Detroit quarters to 1211 Woodward Avenue, Detroit.

The De Kalb Wagon Works, De Kalb, Ill., has purchased the balance of the Randolph truck industry and intends to go into truck building on quite an extensive scale.

Diamond Chain & Manufacturing Company, Indianapolis, Ind., has purchased a large plant on the corner of Ohio and West Streets, Indianapolis, which will give it much needed additional facilities.

United States Tire Company is building two-story and basement brick building at 5935-37 Baum Boulevard, Pittsburgh, Pa., which will be used exclusively as a service station for its solid motor tire department.

New Incorporations

Packers Motor Truck Company, Wheeling, W. Va., has reorganized and has a better and larger company than ever.

Bois Car Truck Company, New York City, has been incorporated with a capital stock of $150,000 to manufacture and deal in trucks, etc.

Tuttle Motor Company, Canastota, N. Y., has been formed to manufacture the Tuttle truck, 1½ and 2-ton. Officers are: J. S. Munro, president; William H. Patten, vice-president. The truck will sell for $1800.

Atlas Tractor Truck Company, Los Angeles, Cal., has been incorporated with a capital stock of $100,000. Directors are: E. E. Elliott, C. Sangster, J. A. Tuthill, C. W. Snyder and R. S. Dickinson.

Commercial Motor Sales Company, of Columbus, Ohio, has been taken over by a new company with $50,000 capital, known as the Commercial Motor Car Company, Inc., by B. A., E. H. and W. G. Hoelscher, W. G. Vossler and George Schorr.

Schacht, G. A. Motor Truck Company, Cincinnati, O., has been incorporated with a capital of $25,000 by Gustave A. Schacht, William Schacht and Charles R. Talbott. The new concern will have temporary headquarters at Spring Grove Avenue and State Street. A factory site is being sought. The company will manufacture motor trucks only.

Financial and Legal

Victor Motor Truck Company, Buffalo, N. Y., which recently assigned to M. W. Comstock, has been petitioned into bankruptcy.

Schacht Motor Car Company, Cincinnati, O., which is temporarily in hands of Receiver J. F. Dietz, will be reorganized in a short time.

Lansden Company, Allentown, Pa., recently removed from Newark, N. J., has been placed in the hands of M. Paddock and M. E. Kern as ancillary receivers on petition of some of the creditors.

New Models

Packard Motor Car Company, Detroit, Mich., has added two more models to its line of commercial cars, which now includes two, three, four, five and six-ton models.

Mogul Motor Truck Company, 6100 Maple Avenue, St. Louis, Mo., has under construction a new 2-ton truck which will be put on the market November 1st.

Perfex Company, Los Angeles, Cal., is adding a 1000-lb. capacity truck to its output. This truck will be equipped with a 20 h. p. motor of the T head type, and an anti-smoking device will be incorporated in the pistons. The motor is designed especially for hard wear and long life. The springs will be full elliptic front and back, and the truck will have a speed of 35 miles an hour.

Conventions of Interest to the Trade

The list of conventions given herewith is published each month so that commercial car manufacturers can communicate with the proper authorities with the idea of arranging to give lectures, illustrated talks, statistics, etc., to show the advantage of motor trucks in these various lines; also possibly to show and demonstrate their cars.

National

July 17-19—at Buffalo. American Society of Heating and Ventilating Engineers; E. A. Scott, Secretary, 29 W. 39th St., New York City.

July 21-24—at Omaha, Neb. (Rome Hotel). National Cleaners' and Dyers' Association of the United States, and Canada.

July 21-25—at Philadelphia, Pa. National Leather and Shoe Finders' Association will convene at the Bellevue-Stratford Hotel. C. W. Summerfield, Secretary of the Merchants' & Manufacturers' Association will prepare for the event.

August 6-8—at Hotel Statler, Cleveland, O. International Apple Shippers' Association; R. G. Phillips, Secretary, Rochester, N. Y.

August 14-16—at Macon, Ga. National Electric Lighting Association; W. L. Southwell, Chairman of Executive Committee.

August 18-21—at Butte, Mont. American Institute of Mining Engineers; Bradley Staughton, Secretary, 29 W. 39th St., New York City.

August 19-22—at Minneapolis, Minn. Society of American Florists; John Young, Secretary, 54 W. 28th St., New York.

August 25-30—at Cincinnati, O. (Hotel Sinton). National Association of Retail Druggists; T. H. Potts, Secretary, 122 South Michigan St., Chicago, Ill.

September—at Chicago. International Congress of Refrigeration and American Association of Refrigeration; J. F. Nickerson, Secretary, 431 South Dearborn St., Chicago, Ill.

September 22-24—at Chicago, Ill. American Meat Packers' Association; Geo. L. McCarthy, Secretary, care of *The National Provisioner*, New York.

October—at New York (Museum of Natural History). National Association of Gardeners; M. C. Ebel, Madison, N. J.

October 1-4—at Atlantic City, N. J. (Hotel Shelburne). United States Brewers' Association; H. F. Fox, Secretary, 109-111 E. 15th St., New York City.

October—12-17—at Chicago, American Institute of Metals; Secretary, W. M. Corse. Lumen Bearing Co., Buffalo, N. Y.

October 12-17—at St. Louis, Mo. Carriage Builders' National Association; H. C. McLear, Secretary, Mt. Vernon, N. Y.

October 14-16—at New Orleans, La. Grain Dealers' National Association.

October 15-17—at Richmond, Va. American Gas Institute; Geo. G. Ramsdell, Secretary, 29 W. 39th St., New York City.

October 21-25—at New Orleans, La. International Association of Electrotypers; R. J. Wilhelm, Secretary, 64 South Division St., New York City.

October 21-25—at New Orleans, La. United Typothetae of America; F. W. Heath, Secretary, 1650 Transportation Bldg., Chicago, Ill.

October 24—at Chicago, Ill., American Iron & Steel Institute; James T. McCleary, Secretary, 30 Church St., New York City.

Fire Associations

July 22-24—at Cortland, N. Y. Central New York Volunteer Firemen's Association; James L. Murphy, President.

July 22-25—At Perry, Ia. Iowa State Firemen's Association; Chief Dan Flanigan, Perry, Ia., in charge.

July 24-25—at Bolivar, N. Y. Southwestern New York Volunteer Firemen's Association.

July 29-31—at Toledo, O. State Convention and Tournament of Firemen; H. Willhauck is Corresponding Secretary.

August 11-12—at Punxsutawney, Pa. Western Pennsylvania Firemen's Association.

August 12-15—Wilmington, Del. State Firemen's Convention; J. D. McNeill, President.

August 19-20—At Sandy, Utah. State Firemen's Association.

August 28—at Bayshore, L. I., N. Y. Suffolk County Volunteer Firemen's Association Tournament.

September 1-6—at New York City. Fire Chiefs' Association 41st annual convention; Exhibits will be found at Madison Square Garden; James McFall, Secretary, Roanoke, Va.

September 26-29—at New Bedford, Mass. State Firemen's Association.

October 13-18—at Philadelphia, Pa. National Fire Prevention Conference; Powell Evans, Chairman, Room 420, City Hall, Philadelphia.

State Conventions and Fairs

July 21-23—at Atlanta, Ga. Annual Convention of Retail Merchants' Association of Georgia; J. W. S. Hardy, President.

July 21-26—Grand Forks, N. D. North Dakota State Fair.

July 22-25—at Chillicothe, Mo. Livingston County Fair; A. M. Shelton is Secretary.

July 24-26—at Cedar Point, Ohio. Ohio Builders' Supply Association.

July 29-31—at Hamilton, N. D. Pembina County Fair and Exposition Association will hold fair.

August—at Warren, Pa. Retail Merchants' Association of Pennsylvania; J. W. Kendall, Chairman.

August—at Galveston, Tex. Cotton Carnival, Galveston Commercial Association; F. M. Lege, Jr., Chairman.

August 1-30—at Empire City Park. Greater New York Fair and Exposition; John A. Murkin, Poultry, Heidelberg Bldg., Broadway and 42nd St., New York City, is Manager.

August 4-8—at Rochester, N. Y. Convention of Retail Grocers of the State, at Powers' Hotel.

August 5-7—at Grand Rapids, Mich. Michigan Funeral Director's Association. Charles E. Whitcomb, of Oxford, Mich., is Chairman of Executive Committee.

August 5-7—at Grand Rapids, Mich. Michigan Association of Rural Letter Carriers.

August 5-8—at Taylorsville, Ky. Spencer County Fair Association.

August 7-9—at Warren, Pa. State Convention of Retail Grocers.

August 11-13—at Racine, Wis. Retail Grocers' and General Merchants' Association.

August 18—at Minneapolis, Minn. American Florists' and Ornamental Horticulturists' Society; J. K. M. L. Farquhar, of Boston, Mass., is President.

August 18-22—at Salem, N. H. Rockingham Park Fair.

August 19-22—at Cortland County, N. Y. Cortland County Fair; W. J. Greenman is Secretary.

August 26-29—at Norwich, N. Y. Chenango County Agricultural Society will hold Annual Fair.

August 26-29—at Norton, Kan. Annual Fair of Norton County Agricultural Association; M. F. Garrity, Secretary.

August 26-29—at Ellensville, N. Y., Ulster County Agricultural Society will hold Annual Fair.

August 28-29—at Helena, Mont. Helena Flower Show Association; Dr. L. M. Rheem, Secretary of Commercial Club, is interested.

August 28-29—at New Hartford, N. Y. Central New York Horticultural Society will hold show.

September 1-5—at Chatham, N. Y. Columbia County Fair, under auspices of Columbia County Agricultural Society.

September 1-5—at Orangeburg, N. Y. Rockland County Fair, under auspices of Rockland County Agricultural and Horticultural Association.

September 3-13—at San Jose, Cal. Retail Grocers' Association Show; A. F. Emlay, Secretary.

September 8-11—at Herkimer, N. Y. Herkimer County Agricultural Society will hold Fair.

September 8-13—at Syracuse, N. Y. New York State Fair.

September 9-12—at Wilmington, Del. Delaware State Fair, at Wawaset Park.

September 10-11—at New York City. Annual State Convention of Master Bakers, to be held in Arion Hall.

September 10-12—at Atlantic City, N. J. Annual Convention of Pennsylvania Millers' State Association, to be held at St. Charles Hotel.

September 11-13—at Mankato, Minn. State Fair, under auspices of Mankato Fair Association; Charles T. Taylor is President.

September 16-18—at Gorham, Me. Cumberland County Agricultural and Horticultural Society will hold Fair.

September 16-19—at Ottawa, Kan. Franklin County Agricultural Society will hold fair. R. J. Finley is Secretary.

September 17-19—at McAlester, Okla. Pittsburgh County Fair.

September 18-20—at Newark, N. Y. Annual Fair of the Newark Fair Association.

September 22-26—at New York City. Annual Convention of American Association of Master Bakers; Charles E. Abbott, 236 Eighth Ave., is Chairman.

September 22-27—at St. Joseph, Mo. Fair under auspices of the St. Joseph Interstate Fair Association. Headquarters at 5th and Francis Sts.

September 23-25—at Mercer, Pa. Annual Fair Mercer Fair Association.

September 23-26—at Rochester, N. H. Rochester Agricultural and Mechanical Association will hold fair.

September 23-26—at Minneapolis, Kans. Ottawa County Fair Association will hold Fair. J. E. Johnson, Secretary.

September 23-27—at Hope, Ark. Hempstead County Union Fair.

September 23-October 4—at Oklahoma City, Okla. Seventh Annual State Fair and Exposition; J. S. Mahan, Secretary.

September 24-27—at Mt. Kisco, N. Y. West Chester County Agricultural and Horticultural Society, Inc., will hold Fair.

September 25-27—at Palmyra, N. Y. Annual Fair of Palmyra Agricultural Society.

September 27-October 3—At Sedalia, Mo. Missouri State Fair; John P. Stinson, Secretary of Fair Association.

September 30-October 2nd—at Larned, Kan. Pawnee County Agricultural Association will hold Fair; T. C. Wilson, Secretary.

October—at Tulsa, Okla. Convention of International Dry Farming Congress.

October 1-2—at Fredericksburg, Va. Rappahannock Valley Agricultural and Mechanical Fair Association will hold Fair; A. P. Rowe, President.

October 1-3—at Abilene, Kan. Dickinson County Fair Association will hold Annual Fair.

October 4-11—at Denver, Colo. Electrical and Industrial Exposition, by the Colorado Electrical Club; L. M. Cargo, 1052 Gas & Electric Bldg., is Chairman of Committee.

October 7-9—at Brenham, Tex. Washington County Fair Association will hold Annual Fair; C. A. DeWare is President, and F. H. Dever is Secretary.

October 7-10—at Greenwood, Ark. Greenwood Agricultural Show; Jesse A. Bell, Chairman of Finance Committee.

October 8-18—at Wichita, Kan. Third Annual Wichita Fair and Exposition, to be held in the Forum; Walter P. Innes, Manager.

October 13-19—at Chicago, Ill. American Foundrymen's Association will hold convention at La Salle Hotel.

October 20-26—at Macon, Ga. Georgia State Fair; M. V. Calvin, Secretary.

October 21-24—at Wichita, Kan. Business Men's Association preparing for Trans-Mississippi Congress, to be held in Wichita.

December 9-12—at Harrisburg, Pa. Central Pennsylvania Poultry Association will hold exhibition; C. S. Smith, of West Fairview, is Show Superintendent.

December 9-12—at Philadelphia, Pa. American Road Builders' Association of New York City.

December 10-12—at Milwaukee, Wis. Wisconsin Retail Implement and Vehicle Dealers' Association; G. F. Borchardt, South Milwaukee, Wis., President.

February 9-14—at Baltimore. Retail Hardware Association of Maryland, Pennsylvania, Delaware and New Jersey will hold convention; W. P. Lewis, Huntingdon, Pa. is Secretary.

E. V. A. A. TO HOLD CONVENTION

The Electric Vehicle Association of America will hold its next convention at Chicago, on October 27th and 28th. A Convention Committee has been appointed with Homer E. Niesz, of the Cosmopolitan Electric Company of Chicago, 150 Michigan Avenue, Chicago, as chairman.

A Papers Committee, co-operating with the Convention Committee, will arrange the program of papers. Suggestions as to what subjects might well be discussed, and the names of men competent and willing to write papers will be very welcome, and should be sent either to the Secretary, Harvey Robinson, 124 West Forty-second Street, New York City, or to Mr. Niesz.

THE COMMERCIAL CAR JOURNAL

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THE COMMERCIAL CAR AND THE CONTRACTOR

AT the last meeting of the Motor Truck Club in a paper by C. A. Crane, Secretary of the General Contractors' Association, extracts of which paper are to be found in this issue, the reason why contractors are not greater users of trucks was brought out. Several points were made, such as the fact that the contractor made his bid with the idea of using horses, and would therefore not care to change; that the trucks, although having the ability to work in all kinds of weather, were subject to disuse when the work was closed down because other parts of the equipment could not withstand the weather; that if trucks could be used for hauling work when the contracting job was shut down, so could horses, and that on public dumps the trucks had to wait their turn.

Let us consider these objections in detail; if the contractor is an up-to-date one, he has been using a greater or less number of trucks for the past eight years and we see no reason why he should make his bid on the basis of using horses when the work can be done for less with trucks. Mr. Crane says as a reason why material men are larger users of trucks than contractors, is because "the material man is governed almost solely by competition, and if he can save on hauling, he can undersell a competitor, while with a contractor after he once gets the job competition ceases." Here he makes a distinction without a difference. In both cases the amount of work which is obtained is dependent upon the price at which it can be done. With the contractor, although competition ceases after he gets the job, he doesn't get the job unless his bid is right, and if one man can reduce his cost by motor hauling, then the other can reduce the original bid on the contract by the same method, or after he has the work can increase his profits in the same way.

He says the contractor is not in a position to experiment, for his contract carries a penalty for delays and overtime. It isn't necessary for the contractor to experiment now. These experiments should have been made several years ago. At the present time he can make an outside contract at a set figure for the hauling and other part of the work for which trucks are suitable, and can know beforehand just how much it is going to cost. He says, "to the contractor, live stock is live stock, and machinery is scrap. There is always a good market for a horse; this is one great advantage the horse has over the motor truck." The day is fast passing when the contractor's machinery is scrap. Competition is growing keener, and contractors cannot as formerly figure in all new machinery for the job, and throw it away at the end. This may be done with special machines which have to be built for that particular work, but it certainly cannot be applied to motor trucks, which can be used on almost any job. With a horse, the contractor must sell him when the job is finished, or he eats his head off during the idle winter period, but this reason does not hold good with the truck. Aside from the interest on the investment it does not deteriorate, nor wear, nor cost while idle.

The other objections made are undoubtedly valid ones, but it will be noticed that in each and every case these objections are that trucks cannot be used because the horse equipment is still used for much of the work, and each of these objections will fade away, as soon as the bulk of the work is done by trucks. For instance, although the truck has the ability to keep on hauling under adverse weather conditions, it cannot be used because the horses and other parts of the equpiment cannot operate under severe weather conditions. Some contractors already recognize the fact that if they motorize their equipment there will be less months when they will have to shut down, and there will be less idle time for the motor equipment on account of horses and other vulnerable parts of the outfit. He also said that if the weather was such that the work was shut down, if it were possible to turn the truck into hauling material the same could be done with horses. This is granted, but by his own statement, namely, "The superiority of the motor truck oyer horses is not to be denied by the material man, the brewery, the delivery trades," etc., he admits that this same hauling can be done for less money by power, and that at an idle time when every dollar saved will count.

The fact that trucks are made less efficient because of the use of horses is also clearly brought out by the statement that in the downtown districts where the only available dumps are public, these dumps are impracticable for motors because of the long time lost standing, waiting in line with horse drawn vehicles. This, of course, is a condition which is beyond the contractor to handle, but is one of the things that

point to the great future of the motor truck. Just in the proportion that horses are eliminated and prevented from clogging and blocking up the highways and paths to docks, dumps, freight yards, etc., just in that proportion will the efficiency of the motor truck be increased. One of the greatest drawbacks at the present time to the truck is the fact that it has to be jointly used with horses, and is therefore affected by the horse's limitations.

COMMERCIAL CAR SHOW MONEY MORE VALUABLE TO INDUSTRY IF USED TO EDUCATE USERS

IN view of the unsatisfactory results to the trade from commercial car shows held in connection with pleasure car shows, we advocated the holding of a separate commercial car show, preferably in the summer or fall, when outdoor demonstrations would also be a feature. This suggestion was made as a relief measure, knowing that the shows as held were not producing proper results. However, since the consolidation of the Automobile Board of Trade, and The National Association of Automobile Manufacturers into the Automobile Chamber of Commerce, this matter has been thoroughly investigated and a decision reached by them that truck shows shall be discontinued altogether. Nothing has developed further in regard to the show situation, except the decision on the part of local dealers' associations in several cities to hold local commercial car shows.

The shows, if permanently discontinued, will doubtless save a large amount of money to the industry. If shows are going to be held, we still favor an entirely separate show from the pleasure car show, and one in which outdoor demonstrations can be had. But the amount of money which will be saved by discontinuing the shows altogether, if applied to the education of the user, will in all probability bring very much more beneficial returns to the industry than as formerly expended. The disrupting of the routine of manufacturing and the enforced absence from the factories of the prominent men has always been a great disadvantage.

There is a question whether an attempt to continue commercial car shows by the local dealers' associations is not a mistake. These dealers, as a rule, are in no position to spend large sums of money on such exhibitions. In a recent editorial we suggested the establishment in the various cities of a school for drivers under the auspices of the local dealers' associations in those cities. We believe that the money which the local dealers will spend on their individual shows would be put to very much greater advantage in the maintenance of such dealers' association schools, where drivers and owners could be instructed at the minimum of expense.

Our correspondence with manufacturers showed clearly the dissatisfaction with the shows as formerly held, and if any shows are to be held, a disposition on the part of the makers in favor of the outdoor show advocated by us. However, the subsequent discontinuing of the shows altogether is apparently very satisfactory to the commercial car makers and we believe will result in a decided advantage, as the money can be spent in many much more profitable ways.

ADVERSE TRUCK-LEGISLATION STORM SAFELY PASSED

THE truck industry has recently passed through a rather severe storm of adverse legislation. At the present time there is a lull, but from the rumor clouds hanging on the horizon the storm is liable to break again at any time.

The most serious aspect of the situation is the fact that some of the worst of these proposed bills were instigated by organizations of automobile users, who either unintentionally or due to ignorance framed bills which would have worked great hardship to the commercial car industry, had they become laws. We refer particularly to the Buckman Bill of Pennsylvania, and two equally obnoxious measures proposed in Massachusetts. It is indeed unfortunate that such things should be proposed by motorists, and it is to be hoped that in the future any proposed legislation affecting commercial cars will be fully and freely discussed with commercial car organizations before being presented in the form of bills, to any Legislature.

There seems to be a disposition on the part of highway commissioners to think more of the preservation of existing highways than of ways and means of making these highways suitable for modern traffic. It is, of course, realized that there should be certain weight limitations, as bridges cannot be brought up-to-date without time, but it is certainly a retrograde movement when an attempt is made to limit the progress of modern motor vehicles and prevent further progress because of the limitations of roads and bridges, which were built without taking into consideration modern, up-to-date methods of transportation.

Better Lose the Anchor Than the Whole Ship

ONE-YEAR STATEMENT OF KISSELKAR TRUCK

The Plankinton Packing Company, of Milwaukee, Wis., uses a Kissel Kar three-ton truck. The following statement shows the cost for one year, a saving over the horse drawn vehicles.

Total number of possible days	312
Actual days worked	305
Miles	7,393
Weight handled	6,574,474 lbs.

	Total	Per Ton
Labor	$ 863.34	$ .263
Power	192.07	.058
Oil	50.06	.015
Supplies	28.09	.009
Total,	$1,133.56	$ .345
Engine Repairs	$ .85	$ .000
Transmission	2.50	.001
Tire Repairs	214.08	.065
Other Repairs	150.46	.046
	$ 367.89	$ .112
Interest and Insurance	$ 239.72	$ .073
Deposit (15%)	449.80	.137
Total	$ 689.52	$ .210
Grand Total	$2,190.97	$ .667

Total number of hours	3,044¾
Number of stops	4,543
Pounds per stop	1,447
Total number of gallons	1,622½
Miles per gallon	4.56
Cost per mile	$ .29
Total cost per day	7.18
Miles per ton	2.25
Total number trips	1,193

The item above under "Other Repairs" includes daily washing of truck required by government regulations at a cost of 35 cents per day.

NEW SPLITDORF BRANCHES

At Atlanta, Ga., the Splitdorf Electrical Company of New York has established a branch at No. 8 Harris Street. This is a direct branch with all modern testing apparatus for the various electrical ignition outfits. A complete stock of new goods, also parts for every outfit of Splitdorf manufacture, is being carried. A branch, along similar lines, was also established at 290 Halsey Street, Newark, N. J. Toronto, Canada, will also have a Splitdorf branch.

THE LUVERNE AUTOMOBILE MANUFACTURING COMPANY, of Luverne, Minn., has placed upon the market a four cylinder unit power plant, completely equipped, consisting of motor with carburetor and high tension magneto attached, multiple disc dry plate clutch, selective type transmission with control levers and pedals attached and connected, ready for installation into any style of motor vehicle. The motor is equipped with electric generator and self starter, if desired. The outfit is guaranteed for a year.

Steel and Rubber Markets

Steel Still at $26.50

Since the first of July, average operations by all the steel companies have probably been at the rate of 75 per cent. of total capacity, as compared with 98 to 100 per cent. in June. Since the first of July new business taken by all companies has probably been less than 25,000 tons per day, and there is small promise of greater activity before fall.

Quotations on July 14th were:

STEEL PRODUCTS PRICES

Bessemer steel, per ton, mill	26 50	a	.....
Open hearth, per ton, mill	26 50	a	.....
Sheet bars, per ton	27 00	a	27 50
Steel bars, soft base, half ex tidewater	1 56	a	.....

The above prices are at tidewater in carloads and larger lots. For quantities less than 2000 lbs., but not under 1000 lbs., $2.00 per ton additional is charged, and less than 1000 lbs., $8.00 per ton additional.

SHEETS

The following prices are for 100-bundle lots and over f. o. b. mill; smaller lots $2.00 per ton higher.

Gauge—	Black	Galvanized.	Gauge—	Black	Galvanized.
Nos. 22 and 24	2 10	3 10	No. 28	2 25	3 40
Nos. 25 and 26	2 15	3 20	No. 29	2 30	3 60
No. 27	2 20	3 30	No. 30	2 35	3 80

IRON AND STEEL AT PITTSBURGH

Bessemer iron	16 90	a	17 15
Bessemer steel, f. o .b. Pittsburg	26 50	a	.....
Muck bars	31 00	a	.....
Skelp, grooved steel	1 45	a	1 50
Skelp, grooved iron	1 70	a	1 75
Ferro-manganese (80 per cent.), seaboard	60 00	a	61 00
Steel, melting scrap	12 50	a	13 50
Steel bars	1 40	a	1 45
Black sheets, 28-gauge	2 25	a	2 30
Galvanized sheets, 28-gauge	3 35	a	3 50
Blue annealed, 10-gauge	1 75	a	.....
Tank plates, ¼ in. and heavier	1 45	a	.....
Wire rods	29 00	a	30 00
Wire nails	1 80	a	.....
Plain wire	1 60	a	.....
Cut nails	1 70	a	1 75
Barbed wire, painted	1 80	a	.....

Rubber Market Sluggish

Rubber is still at the same figure it was last month, namely 90 cents for Up-river fine. Trading in the principal markets of the world continues on a comparatively small scale and variations in prices are slight.

Quotations on July 14th were:

Up-River—			
Fine	90	a	..
Coarse	55	a	..
Island Fine—			
Island, fine	80	a	..
Coarse	33	a	34
Cameta	39	a	40
Caucho—			
Ball	54	a	..
Central—			
Corinto	54	a	..
Esmeralda	54	a	..
Guatemala, slab	45	a	46
Mexican—			
Scrap	56	a	57
Strips and scrap	54	a	55
Guayule	Nominal		
Balata, sheet	70	a	71
Ciudad, black	40	a	50
Trinidad, black	Nominal		
Africans—			
Massel red	70	a	..
Red Congo	Nominal		
Black Congo	70	a	..
Soudan—			
Niggers	Nominal		
Accra, lbs.	35	a	..
Gambia, prime	52	a	53
East India—			
Smoked sheets	68	a	..
Ceylon, bls. and sheets.	67	a	..
Pale crepe	68	a	..
Borneo I	59	a	60
Borneo II	47	a	48
Borneo III	31	a	32
Pontianac—			
Prime plantation	6	a	..
Palembang	5	a	..

SCRAP RUBBER, DOMESTIC

SCRAP RUBBER.—Domestic scrap rubber was quiet on July 12th, but the market retained a steady tone. Collections are still reported to be moderate and stocks are not augmenting to any material extent. Automobile tires command 9½a10c., according to quantity. Foreign scrap rubber continues steady. According to importers a moderate demand is being received and prices abroad are firm.

DOMESTIC

Boots and shoes	9¼	a	9¾
Tires—			
Automobile	9½	a	10
Bicycles, pneumatic	5	a	5¼
Wagon and carriage, solid	9	a	9¼

Lewando's French Dyeing and Cleaning Company Cannot Get Along Without Trucks

AT the Philadelphia branch of Lewando's well-known dyeing and cleaning house the writer had an interesting interview with Manager Balch. He believes thoroughly in the gasoline car for their particular delivery work, especially in Philadelphia, where the distances are long and to cover the suburbs means an extended trip.

The first machine was put in service about five years ago, this being a Lansden electric fitted with Edison batteries. In those days nearly everything was the lead battery, especially in Philadelphia, which may be said to be the home of the lead battery, and trouble was experienced by incorrect handling of the Edison battery at the garages. In fact it was finally put out of business by being filled with acid.

This company at first had the same idea that many others have had, that they could save money by putting on a cheap driver, and the $12 a week man in charge of the vehicle very soon demonstrated that this was a fallacy. He invariably left the machine with the controller in, which eventually resulted in the truck catching fire. Of course, such a thing would be impossible now, as automatic provision has been made against abuse by inexperienced drivers. After this occurrence, another man was put on the truck, who was supposed to be thoroughly competent, but he was found to be driving the machine when it should have been attended to, which resulted in the car being laid up when most needed. After three years of not too successful use of the electric, the car was sold and an Autocar put in service. The Autocar was chosen, as Mr. Balch freely states, not because he knew anything in particular about the machine, but because it was made within eight miles of his store, and he knew that he could get parts and replacements within an hour or an hour and a half. Along the same reasoning he figured that it was wise to accept the offer of the Autocar Company to garage the machine, and they now therefore care for it and do all repairing and keep the car in first-class running condition. Mr. Balch has not had any reason to regret his choice.

Lewando's Suburban Truck
Making a delivery at the rear of a suburban estate

This machine, as usual with dyers and cleaners, has a panel body, and in this instance has been fitted with a shelf, so that the light boxes can be placed above and other goods below, facilitating handling. The truck is fitted with pneumatic tires. For a year it was operated with air in the tires, but it was found that punctures would occur and other troubles take place at the most inopportune times, and at last the inner tubes were filled with Dahl filler, which has proved very satisfactory, and the car is still running with this filler, which, although it is not equal to air, makes a very good substitute and does away with pneumatic troubles.

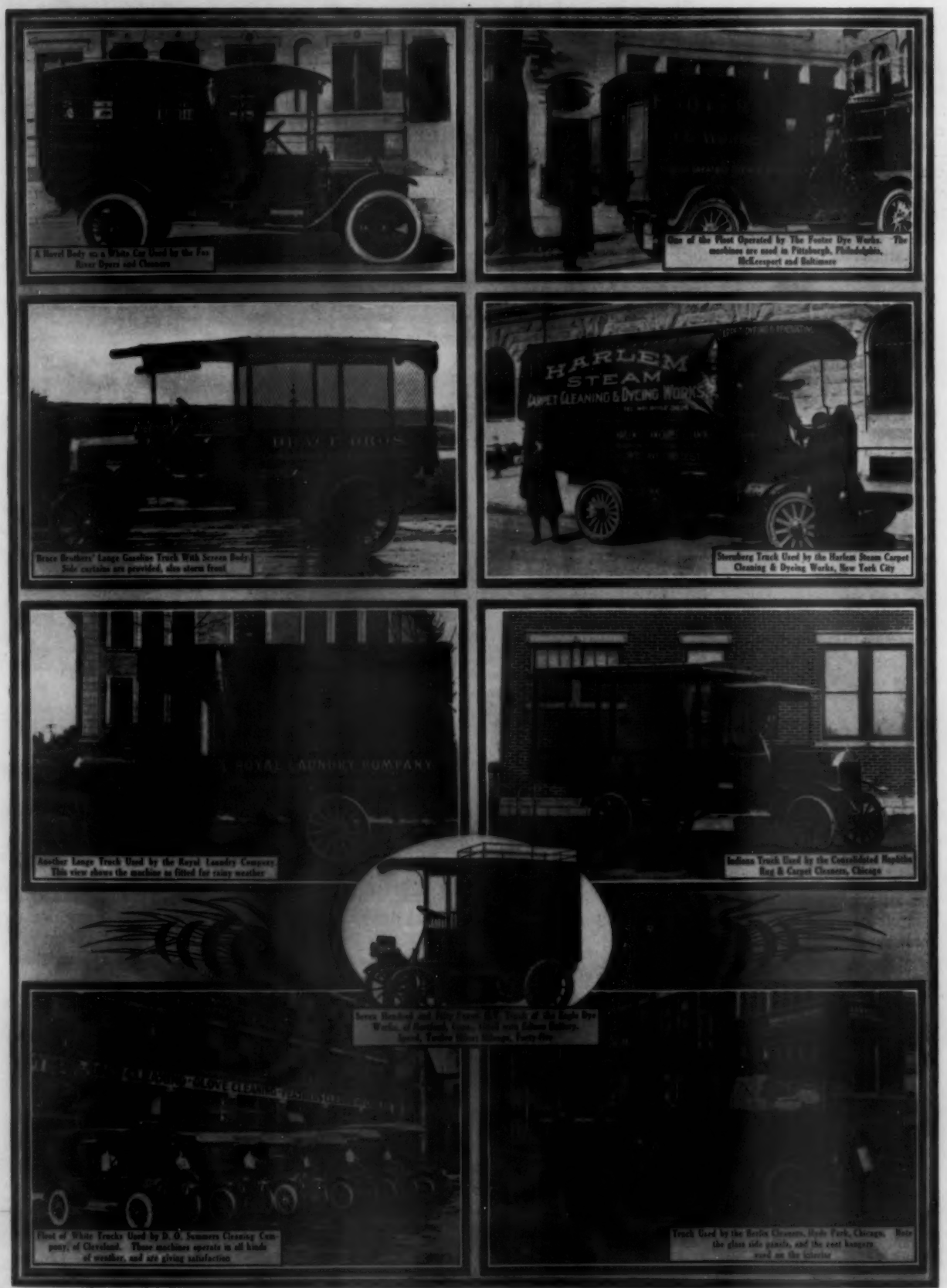
The suburban delivery made necessary a gasoline car, as the company was forced by competition to deliver anything and everything even to suburban districts as far distant as Devon and to points on the Main Line, as the small Philadelphia suburban places along the Pennsylvania are called. The truck averages from 60 to 65 miles per day and has done in an emergency as high as 130 miles in a day.

When asked in regard to drivers, Mr. Balch said: "It is difficult to get good men. Most of them are careless and do not observe the condition of the truck." He further stated that the driver now employed was one that they had trained, the man having formerly been the driver of an express wagon, and he had proved very satisfactory.

When asked whether his experience would warrant the belief that commercial cars were better than horses for his business, he said: "There has been a great change in all delivery systems within the last few years. Why, when I was a boy, I used to go to the grocery store and bring things home. Nowadays people telephone for an yeast cake and the grocer delivers it. In our work, trucks are not only better than horses but are absolutely necessary to meet competition. The business man today must have them unless he has an article in which he has no competition, and one that people want. Present delivery methods are largely due to the intense competition of the department stores, which force them to deliver at express speed to all outlying districts. This has educated the people so that they expect such service. Formerly we used to send packages by parcel delivery by railroad, and when the man arrived at his station he stopped at the package office and asked if there were any parcels for him, and these he took home. People are not content to do this now, but must have everything delivered to the house, and without trucks we would be unable to give this service.

Trucks Displace All Horses with A. F. Bornot Bros. Company

Another pioneer user of trucks is the A. F. Bornot Brothers Company, well known dyeing and cleaning firm of Philadelphia. This concern put in service its first electric machine in 1898, fifteen years ago. A gas car was put in use in 1899. This was a Daimler, but was not considered successful. A steam car of French manufacture was then tried with about the same result. In 1908 several Autocars were used, and in 1909 two Renaults were installed, and this make of car eventually became standard equipment, and the fleet now consists of nine of these vehicles, all with panel bodies and all fitted with pneumatic tires, Mr. Carville, who is in charge of the vehicles, being a firm believer in the use of pneumatic tires on trucks of not over 1½ tons capacity, which is the size of the cars used by the Bornot Company.



Types of Trucks Used in the Dyeing and Cleaning Trade

Most excellent results have been accomplished with these vehicles. This must be accounted for, however, not only because of the fact that the vehicles themselves are of good repute, but because of the long experience of this company with commercial cars; in other words, the trucks are properly cared for and carefully operated. However, no vehicles are kept in reserve, the entire equipment being on the road practically all the time. Some of these vehicles have already seen five years of continuous service, and are now being overhauled and put in condition according to Mr. Carville's statement, for another five years of service. The mileage of one of these trucks averaged over the entire five years, shows a record of thirty miles a day, but, of course, there were days when it did not operate, thus the actual mileage for the days it ran was very much higher.

Garaging and Repairs

No special man is hired to care for repairs, as the repairs have been so slight that the man in charge of the machinery of the plant has been able to look after them in addition, to his other duties; in fact, the statement was made that practically nothing has been required except the renewal of brake bands, and other parts where legitimate wear has taken place. This unusual record can, in part, be accounted for, as the machines are all on pneumatics, Michelin tires being standard equipment. Twin pneumatics are used on the rear.

One of Bornot's Fleet
Loading for a long suburban run. All are on pneumatics

All Horses Displaced

This company gave up all its horses several years ago, and would not under any circumstances think of going back to them again. The most careful record is kept of the cost of operation, and of what the vehicles are accomplishing; in fact, the cars are equipped with tape recording instruments supplied by the Delivery Supervision Company, of Philadelphia, for which a charge of 12 cents a day per car is made. These instruments are merely rented and are not for sale. The tape record is taken from the machine each night by the Supervision Company's men, and their force of clerks go over them at night, and the result reaches the superintendent of delivery's office in the first mail in the morning, showing exactly what the truck did the previous day. Any long stop appears instantly on the tape as a horizontal line, the length being indicated by the number of vertical lines crossed, as shown by the accompanying illustration, a record tape from one of the cars making the Germantown route, this particular record being made on April 1st. Unusual delays can, therefore, be noted at once, and an explanation obtained from the driver as to the reason of such an unusual stop.

An amusing incident is told by Mr. Carville of an experience with a driver which resulted when these recording instruments were first introduced. The tape from one of the machines showed regularly a two-hour stop in a certain outlying section, and investigation showed that the driver had made a practice of stopping at a garage where he indulged regularly in a friendly game of "craps" with his cronies. He was very much astonished that the superintendent knew of his stops, not realizing the purpose and work which was being done by the silent recorder, which to him was merely a "fool accessory," the exact use of which he was not familiar with. It is needless to say that this man was dropped from the company's service.

Suburban Truck Does Work of Eight Horses and Two Wagons

The cars cover not only the city routes, but also points as far out of the city as Devon and the Germantown district. The Devon route truck averages 80 miles per day, and would require at the present time eight horses and two wagons to do the same work. Four of these horses would be used in relays of two on one day, resting the next, while the other four were in service. In fact, a similar route, but of considerably less extent, owing to the sparse population of that section at the time horses were used, was covered by six horses, but eight would be required at the present time. The same is true of the Germantown route.

Cost of Operation

In regard to the cost of operating these vehicles, Mr. Carville stated that they were running on an average of $9 a day, including everything, and that the only vehicles which he had found that could compete with them was a C. T. electric, which could handle the city routes at a total rental expense of $8 per day. The drivers are paid from $12 to $14 per week, and are men who were formerly horse drivers and who have been trained in this service. These men not only deliver, but take care of C. O. D. orders. Each wagon carries a boy, who is dropped off with several bundles and delivers these within a range of two blocks, and is again taken up by the machine, thus making the actual number of stops less than the number of parcels delivered. Packages are also called for. The company now is sure of making deliveries at stated times and can be certain of having the machine at the customer's door at any specified time. The resultant satisfaction to customers on account of the rapid and excellent service given, has played an important part in increasing the business to its present size.

A Day's Record

The following is a record of a day's run by one of these vehicles as shown by the recording tape which we herewith illustrate. The truck left at 9:50 A. M., made 45¼ miles, made 105 deliveries and 35 calls, returning at 4:10 P. M. The individual stops and the time of each are shown by the tape. This is an average performance.

It is just such extended periods of service of trucks as this company's experience shows, which go to prove conclusively that commercial cars, when handled intelligently, are far superior to horses, in not only cost of operation, but in every respect.

Personal Items

E. J. Bartlett, of Cleveland, O., engineer for the Baker Electric Company, has joined B. R. Tewksbury in St. Louis to aid in the electric truck invasion in St. Louis, which the company has projected.

Frank H. Pierce, formerly connected with the Congressional Garage, Washington, D. C., is now connected with the Leffler Company, and will sell Lippard-Stewart, Commerce and Speedwell trucks.

James A. Torney, manager of the Oakland, Cal., branch of the Goodyear Tire & Rubber Company, has been promoted to the position of special representative on the Pacific Coast of the solid truck tire department.

E. M. Denton, formerly agent for the Chase Motor Truck Company, in Baltimore, Md., has been appointed district manager, succeeding C. K. Thomas, resigned. For the present he will make his headquarters in Detroit.

New Agencies

Hotchkiss Motor Car Company, New Haven, Conn., has taken the agency for the Modern truck.

Holmes, Dwight L., 1231 South Flower Street, Los Angeles, Cal., has taken the agency for the Available truck.

June Auto Company, Ferry and Water Streets, Binghamton, N. Y., has taken the agency for the Atterbury truck.

Maryland Avenue Motor Car Company, Washington, D. C., has taken the agency for the Lord Baltimore truck.

Fulton, Allan W. & Company, 720 East Pratt Street, Baltimore, Md., has taken the agency for the Lauth-Juergens truck.

Kahn, Leopold, of Paris, France, dealer in Studebaker, Hudson and Imperial cars for the Philippine Islands and Brazil, has taken the agency for the Federal truck in both the Philippines and Brazil.

Foraker Motor Truck Company, 1700 S. Wabash Avenue, Chicago, Ill., have added the Sternberg trucks to their line and they are now handling the Sternberg, the Bessemer and the Urban electric commercial cars.

Wright Bros. have opened the Electric Garage on Broad Street, Fremont, Neb. General repair work will be carried on.

Denny, Chas. W., will erect brick and reinforced concrete commercial garage at Thirty-fifth and Chestnut Streets, Philadelphia, Pa.

General Motors Truck Company, formerly located at 1121 Locust Street, St. Louis, Mo., has moved to its new building at 2807-13 Olive Street.

Postal-Fair Motor Company, 650 Woodward Avenue, Detroit, Mich., has added the Reo truck to its line. R. E. Fair, general manager of the company, will be assisted by I. Leeds Truax, formerly manager of the local Oldsmobile branch, in the Reo sales.

The Breeze Carburetor Company, of Newark, N. J., has opened a series of branches throughout this country and abroad. The object of these branches is to control all the agencies and distributing jobbers in their respective sections. The branches so far placed are as follows: Horace H. Eckhouse, 260 West Broadway, N. Y. City; Wm. H. Oliver, 305 A. Hodges Building, Detroit; W. L. Eckhouse, 162 North Dearborn Street, Chicago; W. H. Ennis, 937 Graver Street, New Orleans, La.; Foreign Department, F. L. Lyngaas, 320 Produce Exchange, New York; Canadian General Electric Company, Toronto, Ontario; Whiting, Ltd., 334 Euston Road, London, N. W., and A. S. Maritim, Ingenios Alf. Nielsen, Nedre Slotsgate, 2 B, Kristiania.

The Kelly-Springfield Motor Truck Company, of Springfield, O., has just completed a test of its lubricating system used on the new water-cooled Kelly trucks. The record made showed an average of 380 miles to a gallon of lubricating oil. The Kelly system is of the dry base type. The feature of this system is that there is never any oil in the lower crank case proper, the oil being held in a reservoir which is integral with the lower crank case but located at the base. The bottom of the reservoir is ribbed to facilitate radiation, and to assure cool oil. The oil is fed by leads to each main crank shaft bearing, cam shaft bearing and into the gear compartment. The surplus oil not used in the different bearings flows back to the oil reservoir through holes from the lower crank case. The oil is filtered before it passes again into the pump.

A VACUUM ROAD CLEANER

Delegates from municipalities in all parts of Europe recently attended a demonstration in London of a new system of road cleaning by a dustless motor vacuum road-cleaning machine, which consists of a device containing a stiff brush which revolves at great speed close to the ground, creating the suction necessary to remove every particle of dust, mud, or refuse in the road over which it passes. The refuse is automatically deposited in a covered bin at the back of the car, and the suction is so great that mud is withdrawn from the crevices between the stone blocks with which some roads are laid. Paper, tickets and coins, as well as the dirt, were gathered up by the road cleaner, leaving the surface of the road absolutely clean.

American Locomotive Company, New York City, announces the establishing of an office in Buenos Ayres, S. A., by the River Plate Trading Company, who handle the Alco product in South America. Henry S. Dudley is in charge of the new office which is located at 785 Calle Tucuman.

How the Goodrich Buffalo Branch Handles Heavy Truck Wheels

This illustration shows a method which the Buffalo, N. Y., Branch of the B. F. Goodrich Company has found invaluable in the handling of truck wheels. When it becomes necessary to change a tire they begin by backing the truck upon the two skid boards as shown in illustration. This raises the truck so that a stroke or two of the jack sets the wheel free and allows the skid to be removed. The small truck is then rolled into position, and as the wheel is pulled off, it is caught and held in place by the adjustable blocks, and when loaded on this portable platform it can be easily transported to shop or elevator.

A Crisis in the Commercial Car Industry

The Problem of Selling Trucks One of Education. Dealers Must Combine

By E. S. FOLJAMBE

THE selling of commercial cars is unique in many respects. It is different from selling any other piece of machinery. The newness of the thought of power operated wagons has much to do with the difficulty experienced everywhere in convincing owners of the actual advantages of trucks. This is not a theoretical difficulty, but an actual one that costs money.

In almost every line of manufacture there already exists, due to previous use, a natural demand for the commodity, or machines developed from it. In the truck business there is not this ancestry; there is no previous experience, there has never been anything of the same nature before known or used. In addition to this handicap, the equipment which the truck displaces is not mechanical, is not machines, and this alone causes an entirely unsuitable atmosphere for the introduction of high-priced and complicated pieces of mechanism, such as modern motor driven trucks.

The entire attitude and thought of the man who can use trucks is based, and his judgment moulded, by his previous horse and wagon experience. This he cannot get away from. It will require years and years of use of power-driven vehicles before we lose the horse measure of everything pertaining to the commercial car.

Thus far the truck salesman has had, as it were, to create a sort of artificial demand for his product, not that the truck was not needed, or that it would not pay a handsome profit over former methods when once installed, but the absolute lethargy of the user in regard to everything motorfied, as far as it pertained to his own delivery system, is the thing which for the last six years has been the greatest stumbling block in the way of the truck salesman.

Past Methods Must Be Dropped

"It is hard to teach an old dog new tricks" applies with much force to the attempt to prove to the conservative business man who has for years been working along the same rut that it will be dollars and cents in his pocket to drop past methods which mayhap have served him passably well, throw out an equipment in which perhaps he has for years taken the greatest pride, and put in its place something of which he knows nothing, which in itself is an enigma, and which to his mind constitutes a possible means of great loss, although held up to him as the sure method of increasing his business, increasing it not only in actual saving in money over what it is now costing him, but increasing the scope and enlarging his business in every branch and department. These statements reiterated, placed in figures, and vouched for by the experiences of the few who have had the temerity to launch on the unknown tide, are daily being placed before the unsophisticated business man who has not yet thoroughly investigated the commercial car.

The prospective user has for years been content with a horse delivery system which has undoubtedly been the best that the knowledge of man has been able to offer up to this time. Although it had many shortcomings and many disadvantages, he has puttered along and managed to do a fair business. In fact, he has given the delivery end of his business very little thought; it has been turned over to a man who understood horses, who has looked to it that the purchases of new horses were well made, that no animals with inherent weaknesses were bought by the company. He has carefully watched over the stable conditions, avoided forcing the animals during the excessive heat of summer, has instructed the drivers in regard to the care of the horses when overheated. He has refused to send them out in the heavy snows of winter, and in the long run has maintained as fine a set of animals as one would wish to see hauling heavy loads of merchandise.

It is a far cry from these homely and supposedly inexpensive conditions, he is usually ignorant of that they really cost him, to the point where the prospect sees that it is money in his pocket to completely wipe off the slate of his business experience, do away with his horses and with the man who has for years made horseflesh a study, and either replace him by a more expensive man—"a traffic engineer," if the installation is a large one, or in a few exceptional cases, educate him until competent. He may retain most of his horse drivers, who will have to be paid more money, and who therefore will be content to put in a certain amount of time nights at a school, or under the personal instruction of the agent's demonstrator learning to operate the new type of vehicle. These drivers, as a rule, rise to the occasion, expand and become broader gage men after taking charge of a truck.

An Herculean Task

To bring the mass of horse users to this point of enlightenment is the Herculean task before the truck industry today. In conservative sections which are noted for their reluctance to change from any established order of things, the cost of this tremendous work of education has been so great that the pioneer truck agent has gone out of business in the cause of educating the user. By dint of continuous and most strenuous efforts on the part of not only the truck makers, but branch managers, agents and salesmen, a certain number of users have reluctantly consented to purchase, but always with the feeling, many times verbally expressed, "Well, now, we have bought a truck because you say we ought to, now show us;" in other words, the agent's responsibility and experience has only begun when the sale is made; in fact, it has been the experience of a large number of agents that the more trucks they sold the worse off they were.

Many prospects immediately say, "Well, how long are you going to give us to pay for these things; we can't afford to put out any such amount of money at one time," and after being assured that it will be all right if they pay for them any time within six months or a year, they reluctantly and with the air of doing a favor to the dealer, consent to put in service possibly one or two trucks, when they need an entire fleet, and when it is almost impossible to use an individual truck in such a way as to show its real earning capacity, as would be shown if in a properly handled fleet of trucks.

The Sale Marks the Beginning

The dealer then has only begun when after the salesman, the engineer, and everybody from the branch manager or agent down to the latest salesman has been continuously calling on the prospect on an average of once a week for two years, the prospect at last consents to sign his name to the order. Immediately, the agent's real work begins: the radiator leaks; a bearing gets overheated owing to lack of lubrication, either because there was no oiling in the driver's previous years of horse experience, or because of rank carelessness; the engine is allowed to run dry; gears are stripped; the truck is driven without anti-skids and sidesweeps a curbstone to the destruction of the rear wheels; not a machine or part is kept in reserve; innumerable little and petty difficulties arise which under a competent man need never occur, or could be remedied in a few minutes, yet all of these are immediately put up to the agent. "Here we are, with our delivery system paralyzed," says the disgruntled user, "and you got us into this fix, now get us out." The agent in his blind endeavor to make the proper showing, instead of teaching the user, corrects the difficulty with all speed, much in the same way that the mother will do things for the child which she should instruct the child to do for itself. And why? Simply because it can be done quicker and with less work and expense in that way. This is not education, but it is all that the user has been getting. As a rule he is not willing to be educated, and what instruction he gets has been forced upon him. Apparently, all he wants is immediate temporary help, yet he is ready to squeal at the first sign of trouble, due to his own ignorance.

How Dealers Damage Industry

In spite of these inherent difficulties, trucks are rapidly being forced into use in

the business world, but at tremendous expense to the producer and agent. The few cases where conditions were not suited for using power vehicles, and where trucks have been sold by over-enthusiastic or ignorant agents who were willing to sacrifice future business in order to make an immediate gain, have invariably set back the sale of trucks for a more or less indefinite period. Not long since, an agent for a truck which was not too well known, and which did not have any too good a reputation among those who did know it, decided that he would change over to some other make; in fact, he expected to leave the city. He had left on his hands one old seven-ton truck which had been used more or less in demonstration and hauling. A misguided purchasing agent of a large company who had a branch in that city, after he had been worked upon for a long period by various truck agents, finally decided that he would buy a truck. The unscrupulous agent, although he knew that his seven-ton truck was not suitable for the service of this man, sold the truck at a low figure in order to clear himself and get out. This transaction was put over in spite of the protests and remonstrations of agents and salesmen from agencies in whom from past experiences the purchasing agent should have had confidence. As soon as he obtained possession of the truck, he said, "Now I will show you how to make money with a truck; I am going to carry ten tons on that rig." To all of this the agent paid no attention, as he figured he would be out of the city and handling another truck in another part of the United States by the time the machine went to pieces. The usual result followed; in a very short time the truck was ready for the scrap heap, but the awful part of the truck industry is the fact that by this one performance alone a large concern with branches in nearly every large city was convinced that trucks were no good for their work, and have continuously turned a deaf ear to all salesmen who have attempted to prove otherwise. The sale of literally hundreds of vehicles has been "queered," to use the vernacular, by the dastardly performance of this one unscrupulous agent. At the present time in at least one large city an agent is now renting a truck to one of the branches of this company, and hopes that after the consistent performance of this vehicle has been shown month in and month out, and its cost of operation has proven that it would effect a saving of from $4 to $6 a day to the merchant, that he will at last be able to win back this firm that was lost.

Selling Cost Prohibitive

The problem, then, before the truck manufacturer and the agent today is one of education. The question is, can the user be educated without bankrupting the agent? It is freely acknowledged by those in large cities who are familiar with conditions, that an agent, unless he be a man of independent fortune, and willing to spend it, cannot survive these conditions. The cost of not only making the sale, but of continuously supervising the vehicle after it is sold, is, in most cases, prohibitive. Twenty-five per cent. seems a large number, but of this, fully five per cent. goes to the salesman, leaving but twenty per cent. to cover other expenses, such as light, heat, rent of office, and maintenance of service station, advertising, etc. It does not take much of an establishment before the monthly expenses are in the neighborhood of $3000. This means $36,000 a year, that is, forty-eight or fifty trucks must be sold during the twelve months merely to cover the actual running expenses, to say nothing of a profit for the agent. A large part of this expense is due to the excessive service which is required by the user after he has purchased trucks, largely owing to ignorance on his part or that of the driver.

Probably in no other industry does the manufacturer or agent follow up and care for his product even at an actual loss, as is continuously being done in the truck business. There cannot help but be results from the enormous amount of educational work which has been done in the endeavor to sell trucks. But in the meantime, the manufacturers should not continue to force the market at a rate which is so expensive that when all is said and done practically nothing remains as profit.

Truck-Selling Conditions Must Change

If the dealer is to survive, truck business conditions must speedily be changed. The cost of selling and of service must be lowered, particularly the cost of service to the dealer. This can only be done by less service, and this in turn can only be brought about by a more intelligent use of commercial cars on the part of both the user and the driver, particularly the driver. Here, then, is one of the problems which confronts the dealer, "How shall the driver and user be educated at the least expense?"

How the Dealer's Condition Can Be Improved

The other important feature to be considered is, "More advantageous relations of the dealer with the manufacturer." The solution of this problem, it appears to the writer, consists in the formation of strong dealers' associations in every city throughout the country, and these affiliated with a national dealers' organization, for the betterment of the dealer's condition. Such an organization could very soon bring about contracts very much less one sided than the average contract now entered into between the dealer and the manufacturer. Changes in the percentage given; in the distribution of expenses incurred in replacing defective parts; in the cost of parts to the agent; and in many ways such an organization could better selling conditions.

Now is the time to perfect such a combination of dealers throughout the country. A movement to form a national association of automobile dealers, repair and garage men has already been started. The first meeting was called in an informal way in New York City on April 22nd by Frederick H. Elliott, one of the organizers of the American Automobile Association, and even at the time of this writing, the second meeting is being held in the form of a convention at Indianapolis.

Co-operative Schools Suggested

Educating the driver and user is a much larger undertaking than changing the relations between the agent and manufacturer. The solution of this undoubtedly lies in the maintaining of co-operative schools in all the cities by the dealers' associations of those cities. In these schools the present horse drivers of not only the companies who have purchased trucks, but of prospective purchasers, could be initiated into the best methods of operating and caring for commercial cars. These schools could be made virtually self supporting and the writer believes that there are many more horse drivers than is generally supposed, willing and waiting for an opportunity to spend a little money to perfect themselves as drivers of commercial cars. The wise business firms would send their employees. A minor charge just sufficient to cover running expenses could be made, so that such a co-operative school would be no great burden on the dealers, and yet in a very few years its beneficial effect upon the truck users in the vicinity would be felt. In no other way than by educating the driver and the user can the present prohibitive expense of service be lowered.

Increased sales would also result from a more general knowledge on the part of horse drivers as to the operation of commercial cars. These men already in the employ of business houses would exert an influence which cannot be estimated toward the instruction of motor driven vehicles. The owners would feel that among their own men who understood all the special conditions of their business were those competent to handle trucks successfully.

Even the unions of teamsters recognize the future of the commercial car, and in many cities have already purchased trucks for the sole purpose of giving instructions in the care and operation of such vehicles to the teamster members of the union.

Is it not time that the agent and dealer likewise bestir themselves in their own behalf?

MacDonald, C. A. & Company, business experts and accountants, of Chicago, is the first concern in the United States to make a specialty of improving motor truck operation. Hitherto the only method available for business houses to obtain enlightenment on power wagon matters has been to consult with experts retained by the truck manufacturers. The MacDonald Company, which is not connected in any way with any manufacturer of power wagons or accessories, has established a motor truck department and has retained Henry Farrington as consulting engineer and head of the transportation bureau. The company will be a great aid to such concerns as desire a thorough auditing of their transportation department and expert recommendation how to increase the efficiency of their delivery systems.

Theodore L. Grabe, who has been connected with the Oldsmobile Company, of California for the last year, has been made general manager of the automobile sales and service agency to be established in Sacramento, Cal., by the M. S. Bulkley Company, of Los Angeles.

C C J GALLERY of SALES MANAGERS

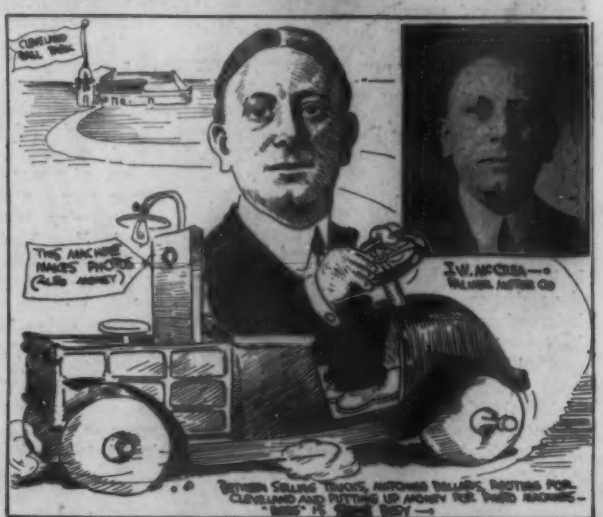
AMBO
MAGNETO
THE BUSIEST MAN IN THE INDUSTRY — LOUIS C. MAGNUSON — MAGNUSON BROS.

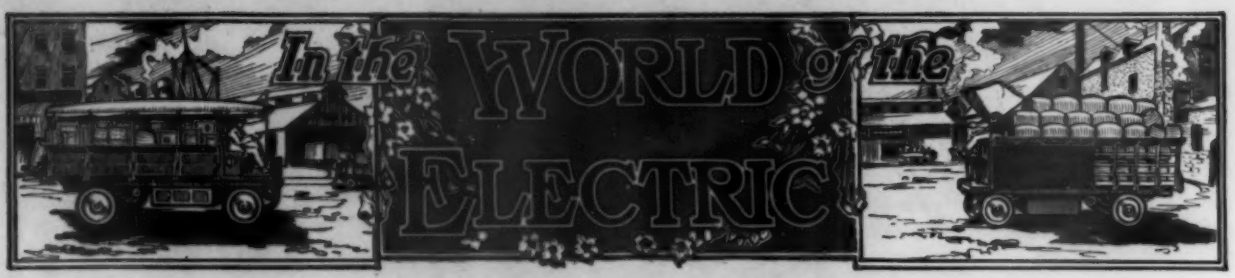
GEORGE SAYS "THIS WILL START ANYTHING — EVEN THE VALUE" BOOM
GEORGE H. DENISTON — DYNETO ELECTRIC CO.

HE HAS TURNED THE EYES OF THE AUTO WORLD ON SYRACUSE
EMMETT BENJAMIN — BENJAMIN MOTOR MFG. CO.
SYRACUSE

T.G. MEACHEM — NEW PROCESS GEAR CORP.
"GEORGE" MEACHEM — THE HAPPIEST MAN IN SYRACUSE — HIS ONLY TROUBLE IS ADVERTISING SOLICITORS.

A. D. DURSTON — THE LEFEVER ARMS CO
"IN YEARS OF BROOKLYN AND ALLEY OF "NAPOLEON" BUT DURSTON ELI HE PLAYED THE GAME. WITH THE SAME OLD TEETH AND THE SAME OLD CHEWIN' HE NOW ADDS THE "LEVERS OF LASTING FAME."


CLEVELAND
THIS MACHINE MAKES PHOTOS (ALSO MONEY)
I. W. MCCREA — VELIE MOTOR CO



Electric Light Companies Pioneer Users of Commercial Cars

All-Motor Service Has Taken the Place of Horses

By E. S. FOLJAMBE

New York Edison Largest Truck User

THE present fleet of electric trucks in use by the New York Edison Company numbers 110, and 23 more machines are ordered. This company is a pioneer in the use of trucks and its vehicles are of almost all makes, a large number being G. V.'s, also Lansden, Baker, Babcock, Anderson, Atlantic, General Motors, Waverley, and some of the old Columbias.

The vehicles just recently ordered are one Anderson, one Lansden, two Atlantics, four General Motors, six Waverleys, five G. V.'s and four Bakers. Five of the vehicles are gasoline touring cars, which are used by officials and department heads where long trips are necessary. The company has its own garages, where this large fleet is cared for, these being on Forty-first Street, Forty-second Street, 107th Street and 140th Street.

Careful Records Kept

Although current is supplied at less than an individual can obtain it for, it is nevertheless charged to the maintenance department at the regular rate. A complete system of daily, weekly and monthly reports is maintained, and every item is known in regard to the cost of upkeep and operation of the trucks. It is against the policy of the New York Edison Company to publish these figures, but the statement was made that they were operating their electric trucks for considerably less than what is considered average operating cost, as cited by manufacturers and agents.

Quick-Acting Truck
Used in Edison Garage for handling the vehicle batteries. A movement of the handle after releasing toe latch.

An itemized record is kept of the repairs and changes, mileage, etc., of each individual tire. In the accompanying cuts are reproduced some of the blank forms on which these records are kept.

Nos. 1 and 2 of this group are the tire record cards. From the upper left corner, card number 1, we see that

Five-Ton Cable Truck
By power winch the heavy cable is hauled through the conduits

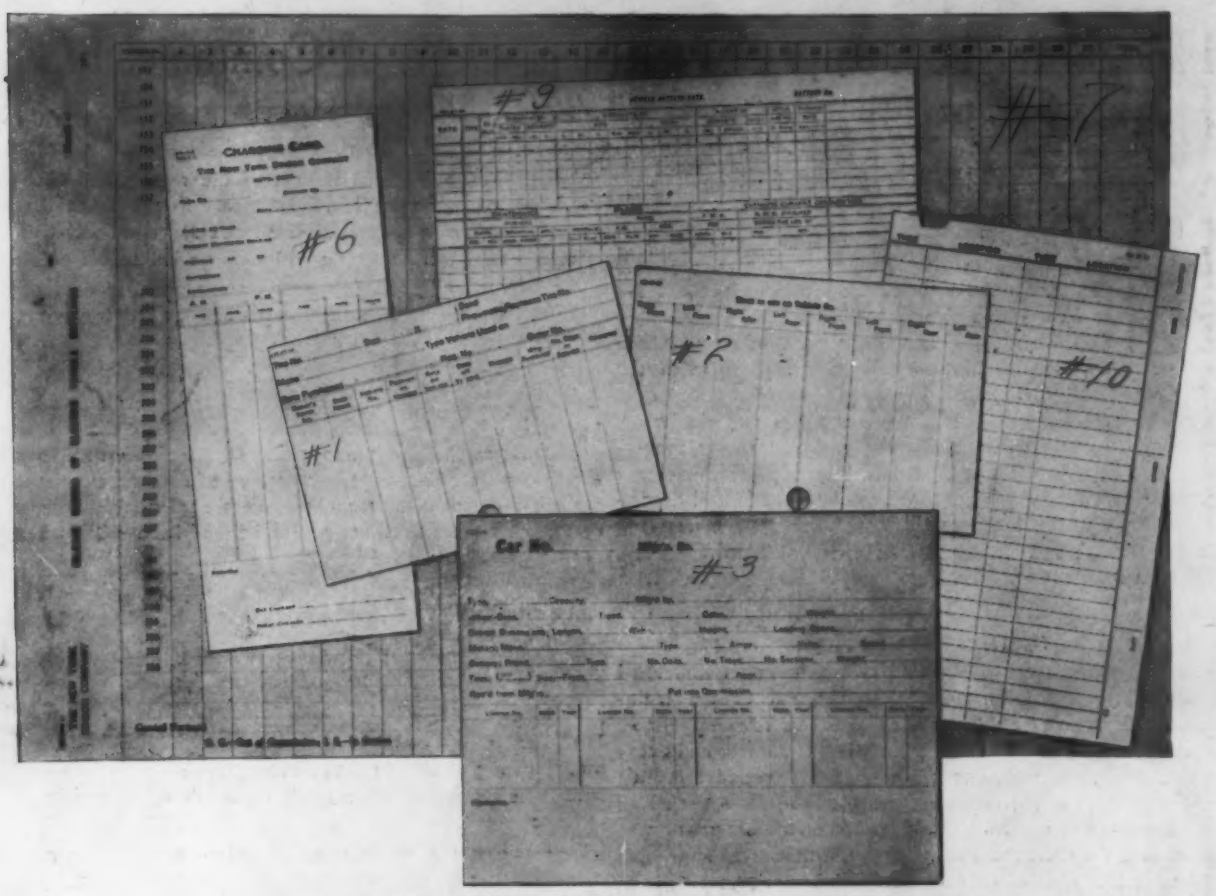
each tire has a number, and this number is also marked on a brass tag or small brass plate which is attached to the felloe of the wheel on which the tire is mounted. If for any reason this tire is removed or put on another wheel, the tag accompanies it and serves as an identification number, so that the record of that tire can be instantly available. The date on which the tire was purchased, the maker's number, and its position on the vehicle and the type of vehicle are all recorded, together with its mileage, as shown by daily records handed in by the drivers, and when removed the reason for its removal is also placed on the card. Card number 2 is a Tire Index Card, and serves more as a record of the tires in use on any one vehicle, each card having a vehicle number upon it, as all the trucks are also numbered for reference in the same way as the tires. On this card is kept a complete record of the tires which have been placed on the truck.

Whenever a new vehicle is purchased by the company all information concerning it is recorded on card number 3. This card is printed on both sides; on the face of it is the name, the type and capacity, all dimensions, such as wheelbase, tread, over all length, width, height, loading space, together with the weight, make of motor, type, all informa-

tion concerning the battery, tires, etc., when it was received from the manufacturers and when put in commission.

Frequent recourse is had to these records, for instance the 'phone rings at the garage, and Mr. Connor is asked: Will number 3 truck go through a doorway 8 ft. high, or will number 6 truck be able to back into a space on the dock which is so many feet wide? This information can be had at once, and saves time and trouble which might occur it vehicles were sent which could not go through these bulletin board in the garage, and each chauffeur daily reports the condition of his vehicle, trip and total odometer record, and signs his name.

Number 9 is a battery record. On this card is placed all data concerning a new battery, just the same as though it were a new vehicle. The dimensions of the jars and trays, thickness of plates, weight of battery complete, etc., are recorded. Then the record of that battery follows, showing when plates, separators, jars or trays were replaced, also



Forms and Record Sheets Used by New York Edison Company

spaces, or were sent for loads which their carrying space would not permit of their hauling. On the back of this card is a mileage summary and also a record of the kilowatt hours. The card is so ruled that it lasts for five years.

The information which is obtained from the daily report sheet or station record, which is not shown, is copied on to repair card number 4, so that a complete list of repairs for each car is kept. On number 5 is also kept a complete record of the going and coming of the car, just as is done in a public garage.

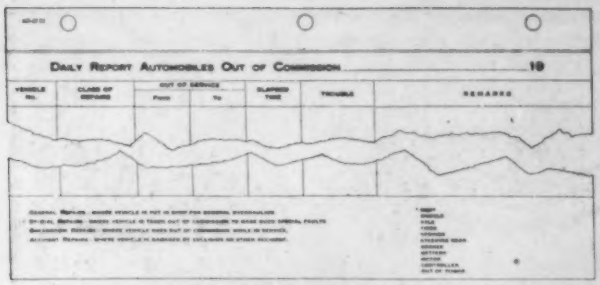
The charging card is number 6, and on it is kept a complete record of the current consumption, the time on charge, etc. This record is copied on to a monthly sheet, number 7, opposite the number of each of the vehicles. On this can be seen at a glance the kilowatt and mileage record of the battery of each of the cars, most of the cars being fitted with Exide. A very large sheet, which is not shown, constitutes a daily report for the chauffeur. This sheet is posted on a

the mileage and the current consumed. This gives a complete record of the life of the parts of that battery.

Number 10 is a "driver's card." This card is carried by the driver on his trip, and on it he keeps a record of all stops and the time. The "job card" is very similar; on this the driver keeps a complete record of when he left the yard, his destination, what materials he had and for what job. The sheet number 12 is the "out of commission card," or a daily report on any vehicle which is being repaired or out of service for any reason. This shows when it went out of service, when it went into service, the kind of repairs, and the elapsed time, together with any remarks concerning the matter. An accident report sheet is also provided, as shown by card number 13, which has a diagram of street crossings and a brief record of all accidents, together with the vehicle number, driver's name and any remarks. In addition to this there is also an accident report blank for the use of injured employees, and to show how thoroughly

Two-Ton Mack Truck Loaded With Two and One-half Tons of Conductor, Wires, etc., and Hauling Five Tons of Poles on Trailer
Boston Water, Light, & Railroad Company's G.V. Truck With Crew, Showing How Single Pole Is Also Carried
A Four Thousand Pound Garford in Use by the Public Service Electric Company, Newark, N. J., Carrying a Miscellaneous Load. Notice the tool box on the side
Six Thousand Pound Garford Truck Carrying Load, Also Crew, With Telegraph Pole as Trailer
White Truck in Use by the Western Electric Company, Showing the Very Large Cage Body With Side Curtains
Large Delivery Wagon of United Electric Light & Power Company, Exchanging Here for Burnt-Out Lamps
Fleet of Thirty-four G.V.'s, Operated by the Edison Electric Illuminating Company, of Boston
One of the Sixteen G.V.'s of the Pacific Gas & Electric Company, San Francisco, Cal., Negotiating a Heavy Grade

Commercial Cars Which Have Displaced the Horse in Electric Light Service


DAILY REPORT AUTOMOBILES OUT OF COMMISSION 19

VEHICLE NO.	CLASS OF SERVICE	OUT OF SERVICE From	OUT OF SERVICE To	CLASSIFIED TIME	TROUBLE	REMARKS

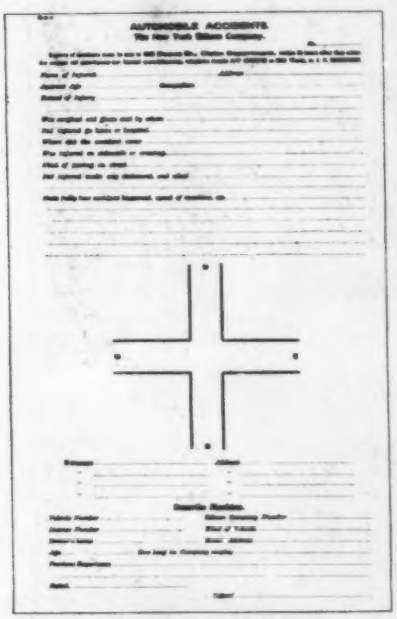
Out-of-Commission Card
Every car out of commission for any reason is recorded on this card, giving reasons for its being idle

such matters are looked into, seven copies of this are made and filed in the various departments, such as the claim, main office, garage, etc.

This company's use of trucks has greatly increased from the beginning, some ten or eleven years ago, and they are continually adding new machines to the fleet.

United Electric Light and Power Company of New York

A marked example of the efficiency of electric vehicles is shown by the fleet now in operation by the United Electric Light and Power Company of New York. All horses have been displaced, the last going out of service some four years ago. The company is now using thirty-five vehicles, which include some gasoline touring cars which are used by the officials, and two 3-ton Packard trucks which are used for long-distance hauling. They have a large number of G.V. trucks, as follows: Two 700-lb., seven 1000-lb., eight 2000-lb., two 2-ton, two 3½-ton and two of 5-tons capacity. Two Ward Electrics of 2000 lbs. each and one Columbia brougham are also used.

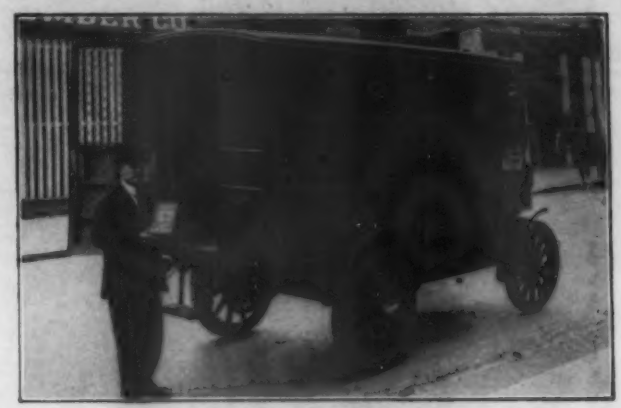

AUTOMOBILE ACCIDENTS.
The New York Edison Company.

Accident Report With Diagram

This company in 1901 purchased a six and then a twelve h. p. Daimler, which were soon followed by other vehicles of the gasoline type. These, however, have all long since been sold or exchanged for new cars. The company does all its own repairing and painting and operates two garages, one at 520 W. Twenty-fourth Street, and is just completing an entirely new garage, which is very up to date, at 514 West 147th Street.

As can be gathered by the introductory remarks, this company was one of the first to realize the advantages of the power-driven vehicle, and some of their electric trucks were in use eight to ten years before being exchanged. None of these old vehicles are now in use, newer machines having taken their place. The trucks are of all sizes, from small lamp wagons up to five-ton trucks fitted with winches for pulling cables through conduits.

The territory covered is all of Manhattan Island from the Battery to the river. The gasoline trucks are mainly used for hauling heavy crated material in bulk from the store rooms. For instance, the lamp shipments are made in bulk,



New York Edison Motor Wagon
Showing the padded compartment shelves

and are carried to the various lamp stations while still crated, and are then distributed by the electric lamp trucks.

Emergency Wagons

Emergency wagons of light weight are used and fitted with the "Pulmotor" for resuscitating people who have been overcome by gas or electric shock, etc. These special or emergency wagons are called upon quite frequently by the hospitals in emergencies and several men have been brought back to life after being pronounced dead by the physicians.

Lamp Wagons

A free lamp renewal is maintained by means of a series of small electrics known as lamp wagons. Each wagon is in charge of an operator who is accompanied by two lamp boys. These take care of renewals, both in business sections and in residential districts. The business firms are visited regularly every month, a fixed schedule being made out a year in advance, and a copy given to each customer. This is done so that the customers will have the old lamps ready for exchange on the day the wagon calls, thus obviating any unnecessary delay, as this is an extremely expensive service, but one which is greatly appreciated and one that is made possible by the speed of the trucks as compared to horses. This service is kept on schedule just like a railroad, so that at any time the traffic department knows exactly where any of its vehicles are.

The large cable trucks are all equipped with electric winches operated from the same battery as the driving motors. These trucks pull one block of cable at a time. All the men travel to and from their work on the trucks, as this has been found cheaper and quicker than having them use street cars or other means of transportation.

(Continued on Page 55)

Trucks and Garage of United Electric Light & Power Company

What One Electric Light Company is Doing to Advance the Sale of Electric Trucks

By CHARLES SMYTHE

IN Denver, a firm which has no trucks of any kind to sell has introduced a system which will do as much toward selling electric trucks as perhaps all the electric truck salesmen in the city combined.

This firm is a manufacturer of electric current—the Denver Gas & Electric Light Company—and, of course, there is a motive behind their energies, which cannot be concealed. They know that every new electric truck installed in the city will mean added sales of current for them, and they are enterprising enough to have gone after the business in a manner which is pleasing and unoffensive to even the gas car salesmen.

It is too much the method of some sales agencies to be through with a truck buyer as soon as the sale is consummated.

Inspection and Advice Free

Right here is where the electric current manufacturing concern begins its work. An electrical vehicle department has been opened, and it is the duty of this department to keep in touch with all users of electric trucks and assist them to get the best possible service from the cars they have purchased. It is entirely a free service department, which is at the disposal of each and every user of electric trucks in the city.

Baker Two-Ton Truck Used by the Denver Gas and Electric Light Company as a General Utility Truck.

If a merchant thinks he is not getting the rated mileage out of his truck, it is not necessary that he go to the salesman with a kick. That might cause embarrassment to either party. But he calls up the vehicle department of the Denver Gas & Electric Light Company, and is first informed exactly as to what is the matter with the car. E. M. Jackson, the engineer in charge of the department, goes over the car thoroughly, testing it all scientifically, and then informs the owner of the car if it is being properly garaged, if the batteries are injured by being "starved" in charging or by being overcharged, and if the cells are all in working order.

If he finds that the garage caring for the car is slighting it in any manner, he tips them off gently that he is aware of the fact and will be compelled to notify the owner of the car if the conditions continue. It invariably results in immediate improvement in the garaging and in the service obtained from the car.

Instruction to Owners

He puts the owner of the car through a course of sprouts as to the proper care the car should have and makes every effort to assist him in getting the best possible service.

They do not try to force a medicine upon the merchants which they are themselves timid about taking. They are pioneers in the use of electric trucks in the city. They use electric trucks for every variety of service, such as heavy coke hauling, trucks for their wire and pole crews, meter trucks, a tower truck, an incandescent globe truck, and a general utility truck. They have at present a total of twenty-four electrics.

General Vehicle Truck, 780 lbs., Used as Town Truck for Trimming all the Street Lights in Downtown District.

Garage of the Denver Gas and Electric Light Company, at Fifth and Lawrence Streets, with G.V. Two-Ton Truck in Entrance.

From 78 to 23 Cents Per Ton

By actual tests they have it down to such a fine point they can show absolute cost of delivery of various sorts of merchandise by horse haulage and the saving derived by electrics. In their own case they have reduced the cost of delivering coke from 78 cents per ton by horse dray to slightly less than 23 cents per ton by electric truck.

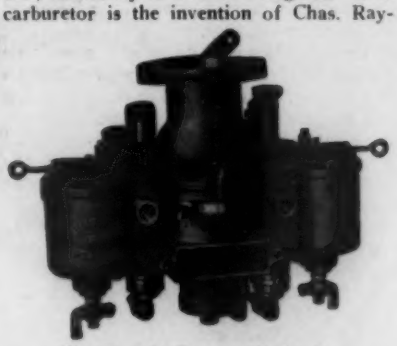
They now have in their garage 9 General Vehicle trucks, 3 Detroits, 2 Studebakers, 2 Hupp-Yeats, 1 Waverley, 1 Buffalo, 1 United Motors Co., 2 Fritchles, and 2 Capitols—the latter four being Denver makes.

Studebaker Six-Ton Electric Truck, Will Carry Six Tons of Coal or Four Tons of Coke.

TRUCK ACCESSORIES AND APPLIANCES

RAYFIELD KEROSENE CARBURETOR

The Findeisen & Kropf Manufacturing Company, of Chicago, has just brought out a combination carburetor employing kerosene, gasoline and water, and which has been designed primarily for use on traction, stationary and marine engines. This carburetor is the invention of Chas. Rayfield, who is now working on a similar device for automobiles and commercial cars.

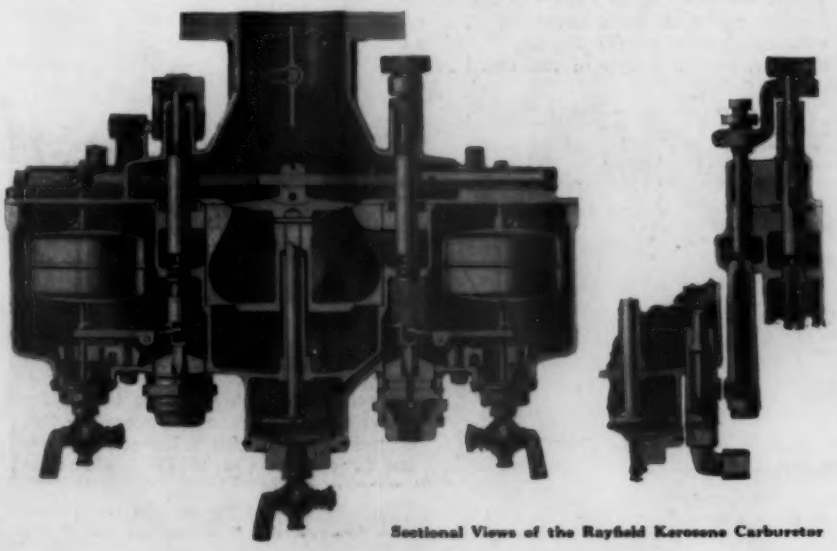


The Rayfield Kerosene Carburetor

The operation of the carburetor is automatic, and it is so designed that a perfect mixture is supplied under all speeds and loads, using kerosene, distillate, or other low grade fuel. Water is automatically fed with the kerosene.

The operation and construction of this carburetor is as follows: it is of the two chamber type, each with a separate float, one for gasoline and the other for kerosene. At the center is the mixing chamber, at the bottom of which is the main air inlet. At the center is also a piston valve, suction operated. The vertical stem of this valve extends downward and carries a small piston operating in a chamber which is supplied with gasoline, this part acting simply as a dashpot to prevent fluttering of the valve. At the upper end of the chamber, at the point of attachment of the manifold is an ordinary butterfly valve, connected to the usual hand throttle. Between the float chambers and the central chamber are passages in which are the metal valves, one controlling the flow of the kerosene and the other the flow of gasoline. It is of course understood that the gasoline is simply used for starting and until the engine is warmed up. By means of a small lever a sleeve can be rotated in the central chamber, cutting off entirely the gasoline end of the carburetor and opening the passages and inlets of the kerosene end. The kerosene passes into the float chamber, following the usual practice, is carried by suction through the middle valve into the central mixing chamber and upward to the engine. At the same time, however, a side needle valve, also operated by the suction, and with a locked adjustment on the needles maximum lift, comes into action, allowing small quantities of water to be drawn into the mixing chamber with the kerosene vapor. The lifts of the needle valves are controlled by levers operated by contact with the central suction operated valve. Therefore, the fuel flow is at all time proportional to the suction. The lifts of the needles are all adjustable, the adjustment being locked in each case. Water is supplied by small separate tank.

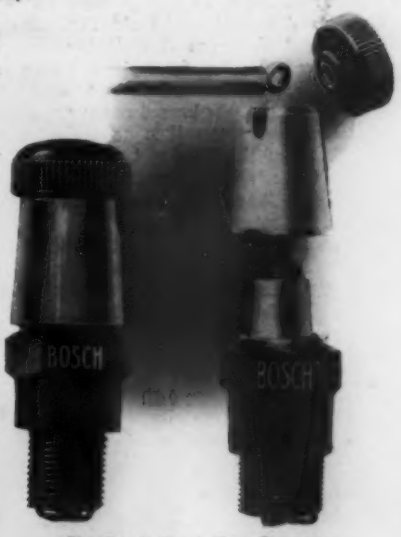
On slow speed tractor engines it has not been found necessary to heat either the incoming air or to jacket the kerosene chamber. There is a constant air opening which is maintained independently of the suction valve at the center.



Sectional Views of the Rayfield Kerosene Carburetor

NEW SPARK-PLUG PROTECTOR

The Bosch Magneto Company, New York City, has recently brought out a spark plug hood which insures the spark plug against dampness and water. There are but three parts, the steatite hood, the asbestos washer and the insulated terminal thumb cap.

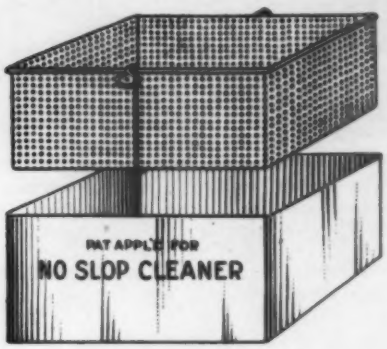


The Bosch Spark-Plug Protector

To place the hood in position, the knurled terminal nut regularly supplied with the Bosch plug is removed, the asbestos ring is pressed into the groove at the base of the hood and the steatite hood is then placed in position, the cable is set in its recess and its loop terminal passes over the threaded central pin of the spark plug. The insulated cap is then screwed in place holding all secure. An insulated and waterproof spark plug is the result. Bosch spark plug hoods are made in all sizes.

NO-SLOP PARTS CLEANER

The No-Slop Parts Cleaner has been placed on the market by the J. H. Just Specialty Works, Syracuse, N. Y., as a handy means for cleaning dirty machine parts. It is especially convenient for handling small parts, such as springs,



The No-Slop Parts Cleaner

washers, ball bearings, etc., which usually get lost in the slime which always collects in the bottom of a cleaning utensil.

The perforated cage prevents the cleaning brush and the parts to be cleaned from dipping into the slime. The outfit can also be used for hardening small tools. The price is $1.50.

SCAIFE WELDED AND BRAZED TANKS

The Wm. B. Scaife & Sons Company, of Pittsburgh, Pa., is manufacturing a line of brazed and welded steel tanks for holding compressed air or gasoline. This company recommends its brazed tank wherever it can be used, and claims it to be of superior quality, and that the brazed seams or joints are actually stronger than any other part of the tank; this having been frequently proven by tests in which the brazed seams have been found intact when the tank burst at some other point.

The welded tanks are made by the Oxy-Acetylene process. These are made in all sizes, the 7 and 8 in. sizes being used by a number of leading car manufacturers in their compressed air starting outfits.

WARNER-DETROIT TRUCK MOTOR

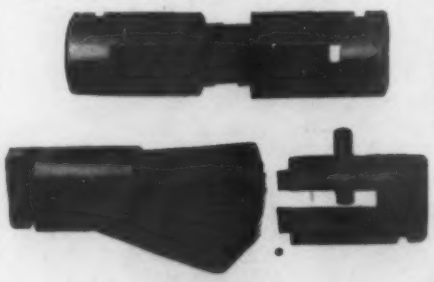
The newly organized Warner-Detroit Motor Works, 1615 Dime Savings Bank Building, Detroit, Mich., is now placing on the market its Model A, 4-cylinder, 25 h. p. motor, which is designed for hard and continuous service and is therefore especially desirable for commercial car use.

The motor is of the long stroke type, 5½ in., and a bore of 3 3-16 in. The crank shaft is extra heavy, 3½ per cent. nickel steel, 2¼ in. in diameter, and is mounted on two long bearings. The valves (cast iron heads and steel stems), are enclosed. All parts, such as the camshaft, cams, water connections, are made large and strong, thus being in keeping with the general heavy design of the motor. The cylinders and upper half of the crank case are cast integral.

The rear end of the motor is machined so as to receive the bell housing of any transmission connection, enclosing flywheel, or to receive cross members for sub or main frame construction, thus giving three or four points of suspension. The flywheel is machined to fit cone or multiple disc clutch.

FRANCKE FLEXIBLE COUPLING

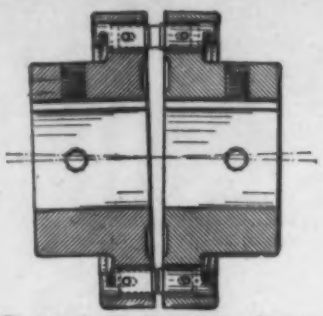
The Francke Company, with Smith-Serrell Company, Incorporated, at 90 West Street, New York City, as general sales agents, has just placed on the market a new form of coupling, to be used on mag-



The Francke Flexible Pin Construction

neto drives and between the crank shaft and gear shafts on automobiles. This coupling, known as the Francke flexible coupling, consists simply of two cast iron flanges connected by flexible steel pins, which can slide, rock or bend.

The illustration shows how this coupling takes care of angular misalignment by the sliding of the flexible pins, and provides for shafts out of center, by the rock and bend



The Francke Flexible Coupling, Showing Shaft Out of Line

of the pins. A combination of these two takes care of all misalignment and relieves pressure on bearings.

The flexible pins, as shown, are made up of laminated clock spring leaves which do the driving. These leaves are held in the end keepers by small steel pins. Between the leaves and the keepers there is provided a short steel shim, which brings all the movement between hardened steel, as the keepers are locked in the coupling halves by snap rings. These snap rings fit in grooves under-cut in the back faces of each flange and also fit in the end slot of each keeper.

The end play of the pins, provided for by the slotted holes in the long leaves, allows ample movement for the operation of cone or disc clutches and at the same time are flexible for such accidental misalignment as is caused by the spring of frames, etc.

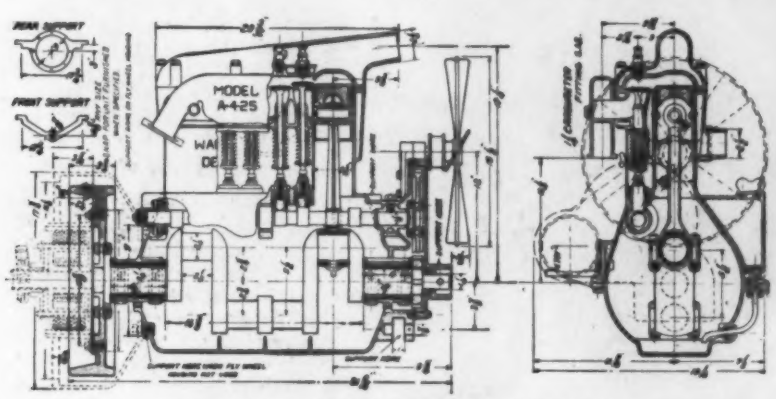
MICHIGAN UNIVERSAL JOINT

One of the features of this joint is its simplicity and the fact that it contains only four pieces, four retainers and two set screws. The joint is designed on the principle of a ball with grooved ball shaped arms working around a central ball on roller bearings for all movements. For the

The Michigan Universal Joint

transmission of power, for wear and for the reception and retention of the ball shaped center blocks and races, there is cut in each arm a 260 degree circular groove or recess.

The center block is made in two pieces, each piece fitting between lugs or shoul-



The Warner-Detroit Four-Cylinder Motor, Model A-4-25

Sectional side and end elevations. Cylinders are 3 1/16 x 5½ in. The flywheel is machined to fit either cone or multiple-disc clutch. By means of a bell-shaped housing, any standard gear can be fitted. Cooling by thermo-syphon system

ders on the opposite piece. The sides of the block are milled to receive the retainer and to allow for free movement of rolls with each revolution of the motive power and for automobile use to give a limited amount of slip or end motion on the rolls at one end and the same time.

The four retainers are made of pressed steel and contain twenty-four rolls and eight balls. The rolls are made of special steel and hardened to stand wear and strain. All wearing parts are hardened and ground and the joint is covered with a dust proof, or tight pressed steel cap. The removal of two set screws permits the joints to be taken apart. The joint is manufactured by the Michigan Auto Joint Company, Grand Rapids, Mich.

THE HALLGREN VALVE LIFTER

A new type of valve lifter has recently been marketed by Carl Hallgren, 682 Summit Avenue, Pasadena, Cal. The same is stamped from cold rolled steel and case-hardened, making it light, tough and durable. It acts quickly and surely, and fits

The Hallgren Valve Lifter

the majority of gasoline engines. The lifter is inserted between tappet guide and washer under valve spring. Bringing lifter handles together compresses the spring, so that the valve spring washer retaining key may be removed and valve taken out. The forked ends of lifter may be spread or closed to fit the valves of any particular engine.

TREMO EXHAUST HORN

The Tremo exhaust horn is manufactured by the D. Henry Bonner Company, Cambridge, Mass., and is so constructed as to permit a clear exhaust, producing no back pressure on the motor. It is so designed that gases from the motor have clear

The Tremo Exhaust Horn

passageway, when horn is not in action and clogging is impossible. There are no parts to get out of order and no coupling, as horn shank clamps over end of exhaust pipe. It produces a pleasing sound, audible for a long distance and sells complete for installation at $6 for 16-25 h. p. motors, $6.50 for 25-40 h. p. motors, $7 for 40-50 h. p. motors, and $7.50 for 50 h. p. motors and up.

THE BOWSER "RED SENTRY"

The Bowser "Red Sentry" is one of the latest fuel dispensing outfits placed on the market by S. F. Bowser & Company, of Ft. Wayne, Ind. This outfit is designed especially for curb use and is of the long distance type.

The cabinet is provided with two heavy cast iron doors which are fitted with an automatic lock. The pump is arranged so that either a pint, quart, half gallon or a gallon can be discharged at one stroke. The outfit includes discharge register, gallon meter, lock, 9 ft. of special rubber hose with portable nozzle and centrifugal filter. The height of the pump is 48 in. and the extreme width, when closed, 15½ in.

The Bowser "Red Sentry"

Bowser Lamp Attachment

The lamp attachment can be fitted to the top of the cabinet by any practical electrician. It is sold separate and not as a part of the outfit, the manufacturers claiming that it is inpractical to build the lamp attachment as part of the cabinet. Sufficient conduit and wire is therefore furnished to extend from the base of the pump to the lamp socket at the head.

RELEASING CLUTCH WHICH ELIMINATES THE DIFFERENTIAL

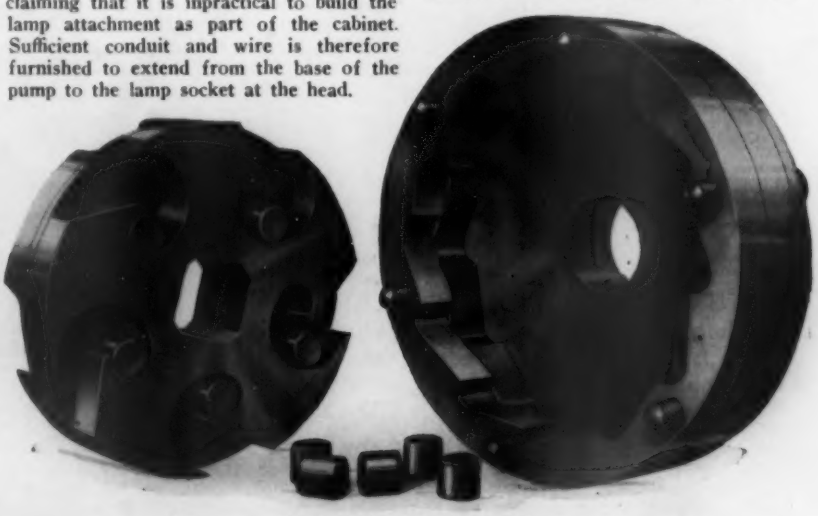
Besides doing away with the differential this device also enables the commercial car to negotiate bad roads with ease, as the device is designed to cause the driving wheels to receive motor power in exact ratio to their respective road resistance. In other words, where ordinarily a car would be stalled with one wheel spinning in soft ground, this releasing clutch would throw all the power of the motor into the one wheel, where needed.

The illustration shows the releasing clutch dismounted showing the pawl-cam (or driving member) removed. One releasing clutch is mounted on each end of a jack-shaft having a one-piece, solid main shaft (not split) continuous from end to end. The differential gears are replaced by a hub keyed to the shaft, carrying the bevel ring gear.

As will be noted from the accompanying illustration each release clutch has two separate cam plates which are grooved in reverse direction. The ratchets in the housings are also reversed.

When the vehicle is making a turn, the outside wheel, describing the greater circle, propels the corresponding clutch housing proportionately faster. As the shaft and pawl-cams cannot revolve faster than the slower revolving clutch housing, the inside clutch transmits all the power to the inside wheel in making a turn. The outside clutch housing is permitted to rotate on the shaft faster than the pawl-cam revolves by the roller being released from engagement and all five being rolled over the slanting surface of the ratchet teeth by the acute portions of the pawl-cam.

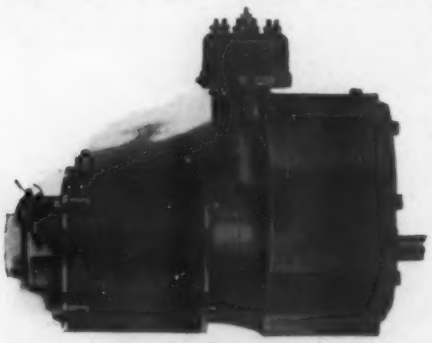
The peculiar construction of the runways and sockets causes the rollers to be held out of, or let into engagement only at the proper instant. Thus there is no possibility of any roller, which engages on reverse drive, reaching the ratchet so as to interrupt its increased speed in making a turn on forward drive and vice versa. This device is manufactured by the Gearless Differential Company, Penobscot Building, Detroit, Mich.



Details of the Releasing Clutch
One releasing clutch is mounted on each end of the jack shaft

BAILEY LIGHT-WEIGHT STARTING, LIGHTING AND IGNITION SYSTEM

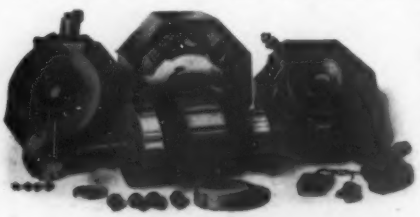
The Bailey Electric Company, Grand Rapids, Mich., is manufacturing an electric lighting outfit and also a combined electric starting, lighting and ignition system. In the lighting system the electric generator,



The Bailey Triple System Outfit

which is the basis of this type, is a little machine only 5½ in. high, 5½ in. wide and 7½ in. long. Its total weight is 17 lbs. and its output ranges from 10 to 15 amperes.

When the headlights are thrown on, it automatically increases its output so as to take care of the increased demand created by their use. This is accomplished by the switch, which when it turns on the headlight automatically cuts out the bucking coil, which is used to control the amount of current generated. The generator is connected to or disconnected from the battery by means of a mercury switch. It starts to generate at a speed of 7 m. p. h. The generator is connected as soon as the speed of the switch is fast enough to distribute the mercury into a little thread connecting the



The Bailey 17 lb. Electric Lighting Generator, Disassembled.

terminals, and when the speed becomes too low, the mercury drops to the bottom of the cavity in the switch and breaks the circuit. The price of Bailey lighting systems of 60 c. p. or less, is $75, and for 100 c. p. outfit, $125, including generator, storage battery, wiring and switches.

Triple System—Starting, Lighting and Ignition

The triple system instrument known as Model 30 D, measures 15½ in. in length and weighs 55 lbs. Operated as a dynamo, it produces 15 amperes, at 6 volts, at a normal running speed of 25 m. p. h. As a starter it is capable of spinning a four-cylinder motor, 3¾ in. bore by 4½ in. stroke with 75 lbs. compression at a speed of 120 r. p. m. The ignition apparatus produces a hot spark at a low speed and has a range of 60 deg. spark advance.

THE LYDON SPEEDLER

The "Lydon Speedler" is the title given by the Lydon Manufacturing Company, of 1146 Michigan Avenue, Chicago., Ill., to a new device, the primary purpose of which is to afford a constant proportion of air combined with a thorough breaking up, remixing and evaporation of the mixture. This device consists of three parts, the controller which attaches to the steering post, the sprayler which screws into the manifold, and the flexible connection which connects the two. The sprayler is inserted in the intake manifold. It is claimed that this device will increase the speed by opening the valves, will enrich the mixture at low speed, will act as an air brake in descending hills,

The Lydon Speedler

by leaving the clutch in, shutting off switch, closing throttle and opening speedler. To prime the engine it is only necessary to inject a charge of gasoline to the air inlet. Kerosene can also be used to decarbonize the engine by unscrewing the brass cap, attaching a small rubber hose the other end of which dips into kerosene. The price of this device is $5.

THE EXCEL AUTO JACK

The Excel Manufacturing Company, of 27 Lansdowne Street, Boston, Mass., has recently brought out a quick acting jack which raises its load with one downward stroke of the lever.

Two Views of the Excel Jack

This jack is 9 in. high when closed and 25 in. when raised, and weighs 35 lbs. It has a capacity of 6000 lbs.; its housing is made of crucible cast steel, with steel rack, cut teeth, malleable iron base and forged steel levers. List price is $15.

A HANDY DEVICE FOR SEPARATING SPRINGS

To get the utmost efficiency out of springs it is necessary that they be greased or lubricated and not filled with rust between the leaves.

To facilitate the greasing process the A. Nelson Manufacturing Company, of 564-

The Nelson Spring Separator in Use

72 West Randolph Street, Chicago, Ill., has brought out a simple device illustrated herewith, which holds the leaves apart. The wedge on the screw is swiveled.

FIRE-DEATH EXTINGUISHER

Fire-Death is a liquid fire extinguisher, manufactured by T. F. Russell & Company, 170 Summer Street, Boston, Mass., the contents of which will extinguish a fire by means of a solution gasifying at a low temperature and producing a body of gas, which immediately smothers the fire. The container is 8½ in. in height and 3¼ in. in diameter. It is provided with a compres-

The Fire-Death Extinguisher

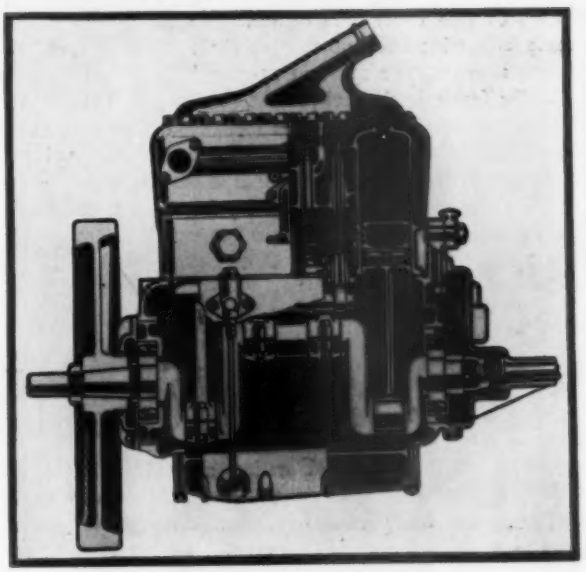
sion cup, with a non-corrosive nickel ball valve and so constructed, that a few strokes of the pump will supply sufficient air to throw the contents 40 ft. It is operated by a needle valve and is ready for immediate use. No pumping is necessary when in use, so that the stream can be accurately directed. This apparatus is listed at $4.

The New Mora Two Thousand Pound Four-Cylinder Truck

THE MORA POWER WAGON COMPANY, 5326 St. Clair Avenue, Cleveland, O., just placed on the market a new model, having a carrying capacity of 2000 lbs. and being powered with a four-cylinder motor. The motor is one of the features of this new model, due to the fact that it is about 35 per cent. heavier than the usual run of motors used for trucks of this capacity.

Details of the Motor

The cylinders are cast mono bloc, L-head type, and have a bore of 3⅜ in. and 5 in. stroke; rated at 25 h. p. The cooling is by thermo-syphon system, supplemented by cellular type radiator and two fans—one for drawing in air and the other for expelling it. The valves are fully enclosed. The crank shaft is 2 in. in diameter, and is made of 35-40 point carbon steel, drop forged and heat treated. It is mounted on double row annular ball bearings. The connecting rods are drop forged steel of heavy I section. The lubrication system is self-contained. A positive pump keeps the oil at a constant level. The motor is three-point suspended. The ignition is by high tension magneto. Carburetor is of the Stromberg type.

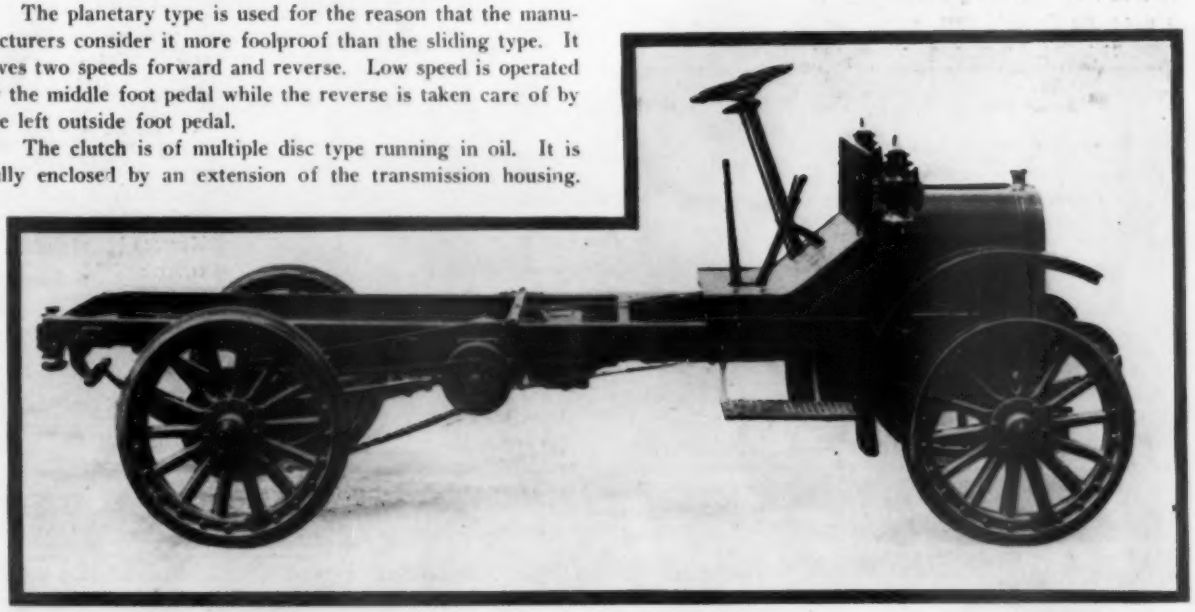


Section of Mora Motor
Note the heavy crankshaft

Transmission and Clutch

The planetary type is used for the reason that the manufacturers consider it more foolproof than the sliding type. It gives two speeds forward and reverse. Low speed is operated by the middle foot pedal while the reverse is taken care of by the left outside foot pedal.

The clutch is of multiple disc type running in oil. It is fully enclosed by an extension of the transmission housing.



The Mora Chassis—Price, $1400

Adjustment of this clutch is very simple, which adjustment can be reached by merely removing a handhole plate on top of the housing. The high speed is operated by a hand lever in the middle of the floor at the driver's right.

Jackshaft and Drive

The jackshaft is bolted right on to the transmission so that clutch, transmission and jackshaft form a single unit. Ball bearings are to be found on each side of the differential while Hyatt rollers are used on the outer ends of the shaft.

A 3½ per cent. nickel steel shaft 1¼ in. in diameter hooks up the transmission with the engine in a straight line drive. On this shaft there are two universal joints of the flange type—one at the engine just behind the flywheel, the other at the transmission.

Drive from the jackshaft sprockets to rear wheels is by means of two roller side chains. Strong distance rods of heavy U section hook up the jackshaft and rear axle. The wagon is geared to a speed of 15 m. p. h.

The frame is channel pressed steel, inswept at front. It is strongly reinforced by cross members and heavy gussets. The frame is 165 in. long, 34 in. wide at the back and 31 in. in front. Frame back of toe boards is 102 in. long.

Springs are semi-elliptic, 38 in. front, 45 in. rear. Special attention has been given to the hanging of the rear springs and axle, so as to reduce shocks on the rear axle to a minimum.

The wheel base is 115 in. The axles are special axle steel drop forgings with heavy spindles. Front axle is of the drop type 1½ in. by 2 in., rear 1½ in. by 2¼ in.

Wheels are of the heavy artillery type with wide felloes and spokes 1¾ in. in diameter. These are built with extra large hub flanges and hub ball bearings. Regular equipment of these wheels calls for a solid clincher tire 2½ in. x 36 in. in front and 3 in. x 36 in. tire on the rear wheel. Pneumatic tires are furnished at an extra charge.

Brakes are powerful and positive. Two sets are furnished. The service brakes are internal expanding located in drums on the rear wheel. They are operated by the right outside foot pedal and are 12 in. in diameter with a 2½ in. face. Emergency brakes are also internal expanding, these operating in drums on the outer ends of the jackshaft. They are 10 in. in diameter with 2½ in. face, operated by a hand lever in the middle of the floor at the driver's right. Both sets of brakes are easily adjusted.

The steering gear is of the irreversible screw and nut type located on the left side. The gasoline tank under the seat holds 12 gal.

This Model 24 Mora sells for $1400, chassis only, in the lead, which includes the front fenders, dash and toe boards, two oil side lamps, one oil tail lamp, horn and tools. Solid clincher tires 2½ in. x 36 in. front, 3 in. x 36 in. rear. A standard open express type body for this chassis would measure 3 ft. 10 in. by 7 ft. 6 in.

Indiana One-Ton Commercial Car

A ONE-TON model, listing at $1800, chassis only, is the latest addition to the line manufactured by the Harwood-Barley Manufacturing Company, of Marion, Ind. The general design is in keeping with the high class construction of this company's two and three-ton models. This model—B-30—can be furnished with a standard stake, express or furniture body at $2000, which price includes in each case a cab over the driver's seat, storm curtains and side curtains for same; also painting and lettering to suit the purchaser.

The motor has four cylinders, 3¾ in. bore by 5¼ in. stroke, cast en bloc and located under the hood. The cooling water is circulated by a centrifugal pump. Lubrication is by splash and pump system. Ignition is by Bosch DU4 No. 2 magneto. The clutch is of the multiple disc type running in oil.

The steering gear is irreversible, and is fitted with an 18 in. wheel. It is placed at the left while the control levers are in the center. The transmission is of the sliding gear selective type, three speeds forward and reverse, mounted on high duty Hyatt bearings. A cover plate at the top permits of easy inspection.

The drive from the clutch to transmission is by a short propeller shaft fitted with a universal joint. The jackshaft is of the full-floating type, and made out of nickel steel 1⅜ in. diameter. Differential can be removed by taking off top cover and jackshaft and

Indiana One-Ton Chassis—Price, $1800

without disturbing either transmission or jackshaft housing. The gears in the differential can be adjusted by removing the top cover. The drive from the jackshaft is by a double chain. Chains are 1¼ in. pitch, roller ¾ in. diameter, ⅝ in. wide.

The frame is made of 5 in. channel section steel, reinforced with gusset plates and weighs 6½ lbs. per foot.

The springs are semi-elliptic front and rear, front springs being 38 in. long by 2½ in. wide, while the rear ones are 50 in. x 2½ in. and under-slung beneath the rear axle.

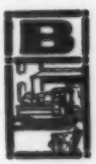
The front axle is of I-beam section, 1¾ in. x 2¾ in. bed, spindle diameter 1 31-32 in. The rear axle is 1¾ in. x 2¾ in. in diameter, rectangular bed. The spindle diameter is 2⅛ in. The spring pad is forged solid to the bed. Both axles are equipped with large roller bearings.

The wheels are artillery type, 36 in. in diameter, fourteen spokes, 1¾ in. spokes in front and 2 in. rear. The regular tire equipment consists of 3½ in. tires in front and 4 in. in rear, all solid. Pneumatics are furnished at extra cost.

The gasoline tank is located under the driver's seat and has a capacity of 24 gal., 4 gal. of which is an emergency supply.

The wheel base is 135 in. Chassis weight is 3300 lbs. The equipment includes three oil lamps, horn and kit of tools.

Bessemer Commercial Cars

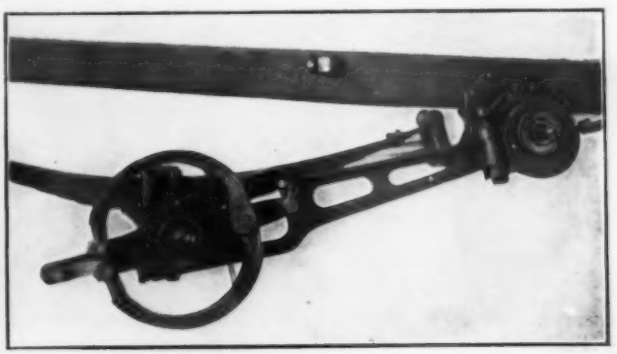


BESSEMER commercial cars are now being manufactured in two models, a 1-ton and a 1500-lb. truck, by the Bessemer Motor Truck Company, Grove City, Pa.

The one-ton truck is fitted with a Continental motor, having four cylinders with a bore of 3¾ in. and a stroke of 5¼ in. Lubrication is by splash and force-feed system and cooling is by water, thermo-syphon system, with honeycomb radiator mounted on a coil spring. The Eisemann ignition system and Rayfield carburetor are used.

One-Ton Bessemer Truck, $1800

A three-speed forward and reverse type of transmission has been adopted, with nickel steel gears and shafts mounted on R. I. V. ball bearings. The clutch is of the cone type faced with leather. The drop-forged propeller shaft has a universal joint at each end. The frame, of pressed steel, heat treated, strengthened with gusset plates, is mounted on semi-elliptic springs in front and platform springs at the rear, these in turn carried by Timken axles, both front and rear.



The Bessemer Radius Rod With Eccentric Adjusting Feature

The wheels, of the wood artillery type, are 34 x 3½ in. in front, while the rear wheels are 34 x 4 in. Solid tires are mounted all around. The brakes are Raybestos lined, acting on the rear wheel drums, both expanding and contracting types being employed. The control levers are located in the center and the steering gear is on the left. The

The Bessemer Fifteen Hundred Pound Commercial Car With Express Body, $1250

wheelbase is 120 or 136 in., and the type of body is optional. This model is listed at $1800.

The special feature is the eccentric drive chain adjustment, which eliminates all trouble and delay in making these adjustments.

The 1500-lb. car has a four-cylinder motor, with 3¾-in. bore and 4½-in. stroke, and enclosed valves. The transmission is of the selective type, with nickel steel gears. The wheelbase is 108 in. Other details are practically identical with those of the above-mentioned model. The price of the 1500-lb. model is $1250, with express body.

LONG ISLAND WORM-DRIVEN TRUCK

The Long Island Auto Truck Company, of 243 West Sixty-eighth Street, New York, N. Y., is manufacturing a worm driven truck for $2800. The body is 17 ft. long, and carries two tons. As shown in the illustration, the rear axle has no torque rods, the semi-elliptical springs acting in their place.

The Motor, Transmission, Etc.

The motor has a bore of 4¼ in. and 5½-in. stroke. The cylinders are cast en bloc and are cooled by a fan and plunger pump circulating system. The Zenith carburetor has a governor attached. The transmission is a Brown-Lipe, three speeds forward with center control. It is located in the sub-frame. The steering is of the Universal adjustable left-side drive type and the ignition is by a dual high-tension Simms magneto. The Hartford leather cone clutch has two Universal joints running from it to the gear box. There are two more Universal joints between the gear box and the rear axle. The rear axle is of Timken worm-drive type and in the front is a regular 5 in. drop-forged axle. There are two sets of brakes on the 40 in. rear wheels. The wheels are shod with 3½ in. dual tires while the 36 in. front wheels have single Goodyear tires. The springs are 44 in. semi-elliptical, Perfection make.

The Long Island Worm-Driven Truck

THE FARQUHAR TRACTOR

The tractor illustrated herewith is built especially for heavy road work, such as done by contractors in road building, also for plowing. It is the product of the A. B. Farquhar Company, Limited, of York, Pa., pioneers in engine and boiler building.

The motor is steel geared throughout and is mounted on a separate steel frame. The motor has four cylinders 6 in. bore, 8 in. stroke; cylinders cast in pairs, with valves in the head.

The rear wheels are 84 in. in diameter, front wheels, 48 in. Two gasoline tanks are placed on top of the water cooler, each having a capacity of 30 gal. Oiling is by splash system with pump and reservoir. Ignition is by Remy magneto. Carburetor of Kingston type.

The transmission is of the bevel gear drive type and operated through friction clutches to get the backward and forward motion. There is a bevel pinion fastened to the end of crank shaft which drives two bevel gears, one on each side which (bevel gears) are bolted fast to friction drums, one on each side of center of motor. These bevel gears run in an oil bath.

A pulley is also fitted at the side to provide means for operating other machinery.

WAGENHALS FOR POST OFFICE

The Postmaster General at Washington recently placed a definite order for twenty Wagenhals cars to be used in mail service. These machines are made by the Wagenhals Motor Car Company, Detroit, Mich.

The Farquhar Tractor

Brennan Furniture Van

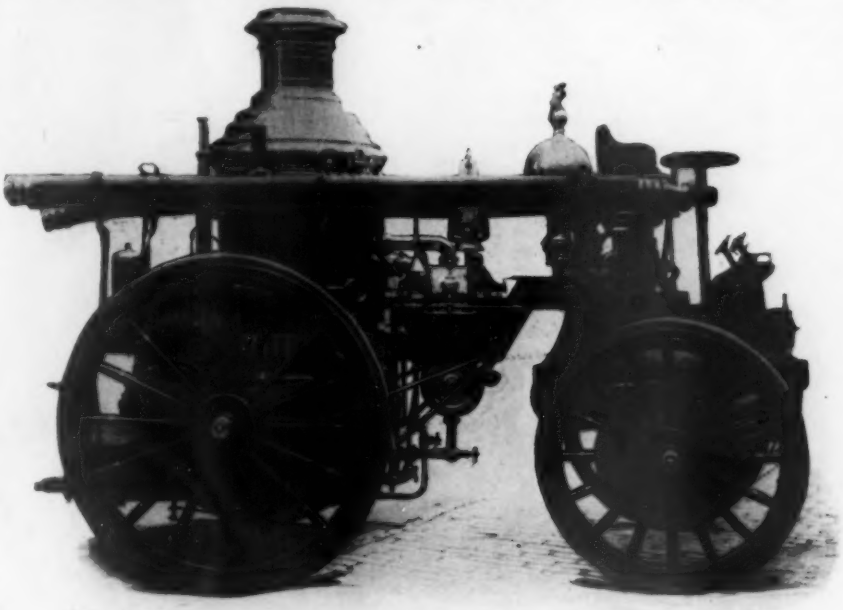
The furniture van herewith shown is the product of the Brennan Motor Manufacturing Company, Syracuse, N. Y., and has a capacity of five tons. The fuel consumption is about 4 miles per gallon and oil consumption 15 miles per quart. This gives a fuel cost of $.047 per mile. The motor is a Brennan standard, 4 cylinder, with 5½ in. bore and 6 in. stroke. Wood block tires were at first employed, but later were replaced by rubber tires.

New Meyers Motor Tractor, Which Converts Ordinary Horse-Drawn Vehicles Into Motor Cars

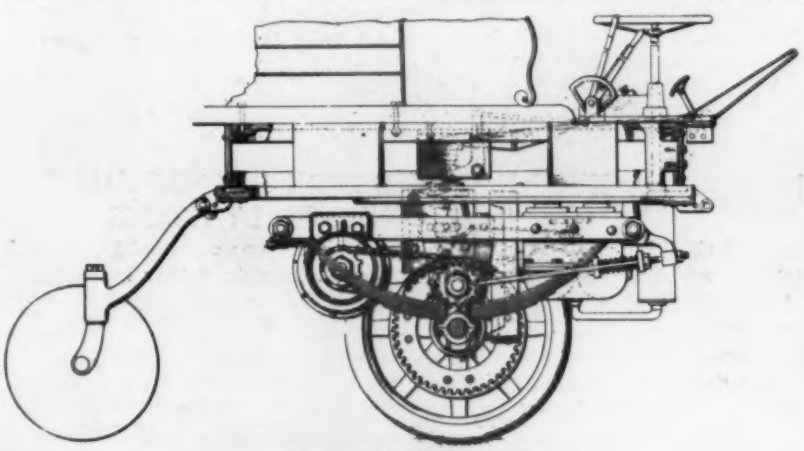
MANY a horse user has made up his mind that he would have commercial cars just as soon as they were entirely perfected, and the prices reduced to a point where he felt he could afford to use them. He has hesitated to throw away and scrap his entire equipment, which must necessarily be done under ordinary conditions when changing from horses to motor trucks, but this condition no longer exists, owing to the very clever invention of J. M. Meyers, of the Meyers Motor Tractor Company, N. E. Cor. Broad and Wallace Streets, Philadelphia. The necessity for keeping the mechanism of a commercial car continuously at work in order to make it pay the largest dividends is now recognized by both the manufacturer and the user. This is why the makers are producing dumping bodies, removable bodies and other types, which allow the goods to be handled in the quickest possible time, and the chassis kept on the move; but in all of these cases the old equipment has had to be thrown out just the same. It has remained for Mr. Meyers to produce the first two-wheeled gasoline unit which can be successfully placed directly under any type of wagon or piece of fire apparatus, which can, as a self-contained unit, by means of a quickly detachable third wheel be driven from place to place, or which, like a horse, can at any time be attached to the pole of a wagon or almost anything else movable, and draw it to any desired position. In other words, Mr. Meyers has perfected and has now had in operation for many months, a two-wheeled, self-contained gasoline driven unit, which actually takes the place of the horse and pulls the load. For years it has been recognized that it requires less power to pull a load than it does to push it wheelbarrow fashion, and this is exactly the operation of the Meyers Motor Tractor.

Essentials of the Meyers Motor Tractor

This latest addition to motor driven vehicles which is in reality but half a vehicle is a very compact unit consisting of two rubber tired wheels on a solid axle, each wheel propelled by chain from a short transmission jackshaft, in turn driven by a compact 4-cylinder or 2-cylinder motor. This entire unit turns by means of a circular rack and pinion upon a fifth wheel, and can be placed under any ordinary horse truck, converting it into a motor truck. The vehicle only has the two rubber tires of the tractor, the rear wheels of the old wagon as usual being steel tired. It can be quickly detached, leaving the empty wagon propped up to be unloaded while the tractor operates another loaded wagon, which makes it invaluable to many lines of business, such as lumber dealers, contractors, and others doing heavy hauling. An attachment somewhat similar to the rear end of a cannon carriage is attached at the rear when moving the tractor from one place to another.



Meyers Tractor Applied to Fire Engine
Thus the old equipment is modernized and motorized with the minimum of expense and the new horse eats nothing when idle



Attachment for Meyers Tractor
To be used when moving tractor from one wagon to another

The outfit is light in weight as compared to the ordinary truck of the same capacity. Its operative mechanism is entirely self contained on the short front wheel chassis, the propelling part of the mechanism weighing about 1200 lbs., which together with the weight of the wagon for carrying a three ton load, would only weigh complete about 3000 lbs., as compared to a weight of about 7500 lbs. for an ordinary truck of the same capacity. In other words, the Meyers tractor under an ordinary wagon would weigh some 4500 lbs. less than the ordinary truck of the same capacity, which, of course, means no carrying of dead weight and economical operation. In connection with economy it may also be mentioned that only two rubber tires are required instead of four as on the ordinary truck, and that less fuel is consumed owing to the fact that the load is pulled and not pushed. The initial cost is also less as a large part of the old equipment is used.

Especially Suitable for Motor Fire Apparatus

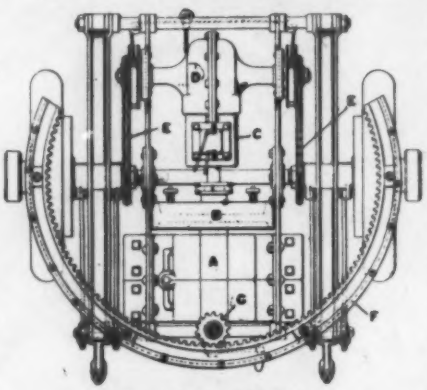
The fire equipment of the entire United States will undoubtedly be converted to the motor driven type before the end of the next ten years. Converting the present fire apparatus to the new modern motor driven vehicle is extremely expensive, if the engines, hook and ladders, hose wagons, chemical engines, etc., have to be entirely discarded and replaced by completely new vehicles. For this purpose the Meyers Motor Tractor is especially fitted as the expensive equipment can be retained intact, simply the front wheels and axle being removed and replaced by the tractor, and this can be done at the minimum of expense. An added advantage is the fact that this mechanism can turn around in its own length, and in much less space than a horse vehicle or the ordinary truck which steers with wheels on steering knuckles. It is also claimed the tractor steers more easily than the ordinary type of vehicle.

More loading space is provided with the same length of vehicle, as the entire platform of the truck is available for carrying, as the tractor mechanism goes under and actually replaces simply the front wheels, no part of the mechanism protruding above the floor except the control levers.

Mechanical Detail of Meyers Tractor

By reference to the accompanying line drawing showing a plan view of the mechanism, the arrangements of the parts can be readily seen. The compact unit consists of an engine A, which in the first tractor built was of the 4-cylinder, horizontally opposed 2-cycle type, but which in later models has been changed to a 2-cylinder opposed 4-cycle motor in the small sizes, and in the larger size to a 4-cylinder vertical motor. The engine drives through the usual clutch B, and sliding gear (in the larger size), and planetary (in the smaller size), transmission C to a short stiff jackshaft D, with the usual differential at the center. From this point the drive is by side chain E to a shock absorbing bracket, carrying another sprocket attached to a short shaft on the opposite end of which is a small gear, meshing with a large internal gear bolted to the spokes of the wheels. A short frame is mounted upon semi-elliptic springs from the axle, although full elliptic springs can be used in cases where desired. This unit is the width of the body of an ordinary three-ton truck, and its length only a few inches greater than the springs.

The front of the tractor forms its own sloping dash, and the control levers of the ordinary type consisting of a change speed gear and brake lever and steering wheel are mounted as usual upon the short chassis frame, beneath which the axle, wheels and mechanism turn as a unit on a fifth wheel. When employed



Plan of Meyers Tractor

Showing the motor A, clutch B, transmission C, jack shaft D, side chains E, driving to each of the small gears which drive the front wheels which are on a solid axle, all the mechanism being supported on springs to a short, stiff frame with fifth wheel. Steering is by pinion G and circular rack F.

in shifting wagons from place to place without actually being used under them, the small castor-like wheel is rigidly attached by an arm to the short chassis frame and as the weight is to the rear the outfit is perfectly stable, and can be driven from place to place as every essential feature of the vehicle is contained in the unit, including the fuel tank. When backed under a wagon which has been prepared for it it can be attached in a few minutes, and no rods, levers, chains, or control connections have to be made, as these are all on the unit itself. The levers, when the tractor is placed in position under the wagon body, come just at the right distance from the seat to be properly handled by the driver.

The construction throughout is rigid and very similar to that of fire engines. As in any other truck the power plant, transmission, jackshaft, etc., are mounted upon springs, and these are protected from road shocks due to unevenness or cobble stones. In special instances an arrangement is made to support the motor on separate springs without disturbing the alignment of any of the driving parts.

The damaging shock of starting is done away with by a patented arrangement of the small driving pinion which drives the internal gear on the road wheel. This pinion, which is shown in the above illustration, is mounted on an arm pivoted on the axle. This pinion is free to roll in the internal gear to a slight extent, its forward motion being limited by a positive stop and its rearward motion by the rod and spring shown.

This may not appear of much importance to the uninitiated, but the difference between success and failure of motor-driven road vehicles is often dependent upon just such shock-absorbing devices. This construction relieves not only the engine, but every nut, bolt and rod of the entire unit of sudden hammer blow shocks, due to road obstructions. In starting, in pounding over cobblestones, or when for any reason there is a jolt given the wheel, this shock is first taken by the coiled spring and is not transmitted to the other parts. When the slack of the chain is suddenly reversed the spring again takes the shock, relieving the gears and the entire mechanism. When starting suddenly the load is again applied gradually and no damaging shock reaches the vital parts. This insures long life, even in the most exacting service.

Steering is by the usual steering wheel and post at the lower end of which is pinion gear G, which meshes with a circular rack F, which is bolted directly to a large fifth wheel. This pinion can be of such a size as to give even a greater leverage for control than when the ordinary wheel and steering knuckle is used.

These tractors are built in capacities of 1, 2 and 3 tons, and sell at prices below the ordinary trucks of same capacities, the 1 ton selling for $1000; 2 tons, $1250, and 3 tons, $1500, making an unusually economical outfit when the fact that the old horse equipment does not have to be thrown away is taken into consideration.

EPIDEMIC AMONG FIRE HORSES MEANS MOTOR ENGINES

Pasadena, Cal., is suffering from an epidemic of glanders in the ranks of the horses of the fire department, and the service is already crippled. Commissioner Loughery made the statement to the press that between $20,000 and $25,000 should be included in the next Budget to secure enough auto fire apparatus for temporary use. For some time there has been a movement afoot to hold a bond election in order to secure complete auto fire equipment for the city, but the present crisis is too acute to wait for that procedure, and an appropriation must be made at once.

KISSELKAR DOES WORK IN ONE-FIFTH THE TIME CONSUMED BY HORSES

One hour and fifteen minutes was consumed by a Kissel Kar four-ton truck equipped with a dump body in delivering a full load of lumber to a destination seven miles distant and returning to the starting point. The work was done for the South River Brick Company, of South River, N. J.

The same day a team of horses hauling a two-ton load of lumber, half the burden carried by the truck, occupied four hours and thirty minutes in making the indentical trip. On this basis, the usual time consumed by horses on the trip in question, it would take nine hours to deliver by horses.

The Final Drive

By C. T. SCHAEFER, M.S.A.E.

FROM the transmission the power must be transmitted to another unit from which it is converted into useful work at the road wheels. This is generally termed the final drive. There are a variety of methods of transmitting power from the transmission to the rear wheels and in taking up the discussion of the final drive, the writer will attempt to cover this subject as clearly as possible and is offering illustrations of a number of different types in use at present.

The majority of commercial cars are equipped with what is known as the double side chain drive. However, this type of drive has its disadvantages, but in all probability will be used until something better is found, the principal objection to it being the attention required to obtain maximum efficiency. It is generally exposed and grit soon finds its way into the numerous bearing joints causing rapid wear. For a while chain cases seemed to be the solution of the problem, but they have fallen off and most all makers are experimenting with different types of shaft drive. This has resulted in the introduction of the bevel gear, internal gear, double reduction and worm gear.

The shaft drive possesses a number of good features in that all working parts are entirely enclosed and are thoroughly protected from mud and water, while it also provides a much quieter and simpler method of final drive.

The chain drive possesses the advantage of slightly greater flexibility than the shaft drive, which tends to protect the motor and tires against shocks, due to rapid engagement of the clutch.

In this type of drive the power from the transmission must be transmitted to a unit carrying the driving sprockets and differential and in some cases a set of brakes. This unit is generally termed the jack shaft and may be built integral with the transmission, or in a separate unit, mounted separately or bolted to the transmission. This jack shaft is similar to and performs the same functions as the bevel gear rear axle on pleasure cars, excepting, of course, that it does not carry the weight of the vehicle.

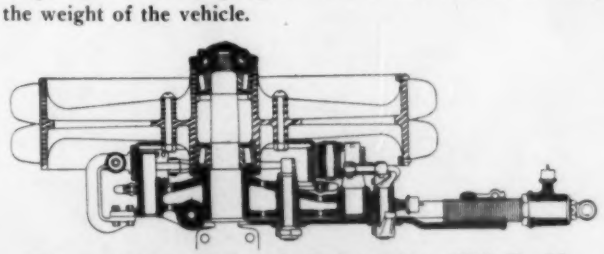


Fig. 1. Sheldon Rear-Axle Construction, With Double Brakes and Steel Wheels

For this purpose a dead rear axle is provided, which has spindles upon which the wheels and their bearings are mounted. Various types of rear axles may be found in use at present, their section being either round, square, rectangular or I-beam. When the jack shaft is provided with a set of brakes, the rear axle is equipped with but one set, but of late there seems to

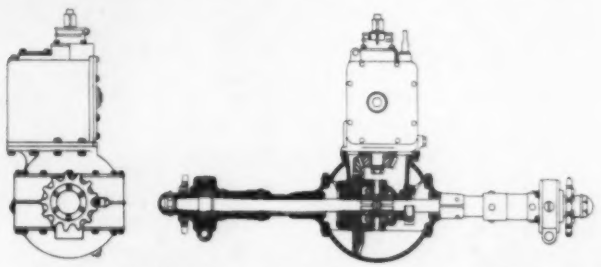


Fig. 2. Sheldon Jack Shaft Bolted to Transmission

be a tendency to place both sets of these brakes in the rear wheel drums.

Some method must be provided to take up the driving thrust from the rear axle to the frame. For this purpose a radius rod is provided, which also takes up the brake pull, and the reaction due to the chain pull, as well as allowing for adjusting the slack in the chain. These rods are generally of the full universal type, being pivoted on the jack shaft tube, and the brake support or spindle of the rear axle. In some cases they are provided with large springs to take up abnormal shocks when engaging the clutch or backing up to a curb.

The chain drive in reality is a double reduction through two units, the jack shaft and rear axle. The bevel gear rear axle is almost universally used on pleasure cars; however, it is seldom used on commercial cars and then only on the lighter models, the principal disadvantage being that it is very difficult to provide more than one reduction greater than four to one. Greater reductions can, of course, be provided, but the driving gear housing becomes of a size which materially limits the road clearance under the axle housing. This has led to the introduction of the double reduction rear axle in which a short countershaft is provided for carrying the two extra gears required. It has also led to the introduction of the worm gear drive in which the bevel gears are replaced by the worm gears and also the internal gear drive which is practically another form of double reduction.

The worm drive has the advantage of providing a higher gear reduction; it is also absolutely silent in operation and a

wide range of gear ratios can be provided without changing the center distance between worm and wheel

The internal gear drive has practically the same construction as the chain drive, excepting that the jack shaft is bolted to the dead rear axle and the sprockets are replaced with internal and external gears, which are located inside of the brake drums.

There are two methods of taking up the reaction of shaft-driven rear axles. In some cases the spring seats are formed intregral or riveted to the axle housing and the front end of the spring pivots upon a stud, thus using the spring for the radius rod and torque arm. Some also use a separate torque arm, or torque tube placed around the drive shaft and anchored to the cross members of the frame and two separate radius rods. At present there is a tendency to use pressed steel channels which are anchored to the frame cross member just above the forward universal joint and rigidly attached to the brake drum flanges, these members acting as both radius rod and torque arm.

The purpose of the differential gear in the final drive is to permit of equally dividing the driving effort of a single source of power between two driving wheels and to allow cars to be steered freely.

There are two types of differential gears in use at present, one using bevel pinions and master gears, while the other uses spur pinions and master gears in its makeup. The bevel pinions rotate upon studs which are clamped at their outer ends between the two halves of the differential housing, while the master gears are mounted upon the driving shafts. A flange is provided on one half of this housing to which is attached a sprocket, bevel spur or worm gear depending upon the type of axle. Figs. 2, 3, 5, 6, 7, 8, 9 depict bevel differentials, while figs. 11 and 12 depict spur gear differentials.

The spur gear type consists of two master gears mounted upon the driving shafts, and a varying number of spur gear pinions which are mounted in the two halves of the housing.

The pinions are made twice the width of the master gears and are meshed in pairs, the pinions meshing alternately with the master gears.

The action of the differential may be depicted as follows: With both wheels running on a drive road surface there is plenty of road adherence and the rate of revolution of each driving wheel and master gear of the differentials is dependent upon the path followed by the road wheel. Suppose the front wheels are in a straight-ahead position and both driving wheels are of equal diameter, then both will rotate at the same speed as will the master gears of the differential. Now when the road wheels are deflected from the straight ahead position the vehicle will travel in a curve and the wheel on the outside side of the curve will be forced to run faster than that on the inside. When this condition arises the differential pinions will turn on their studs, allowing one master gear and road wheel to run faster than the other. The one weakness of the differential is that when one of the driving wheels stands on slippery ground and the power is applied, this wheel will spin around at twice the rate it would under conditions mentioned above, while the other wheel will remain stationary, this condition being due to the differential dividing the propelling

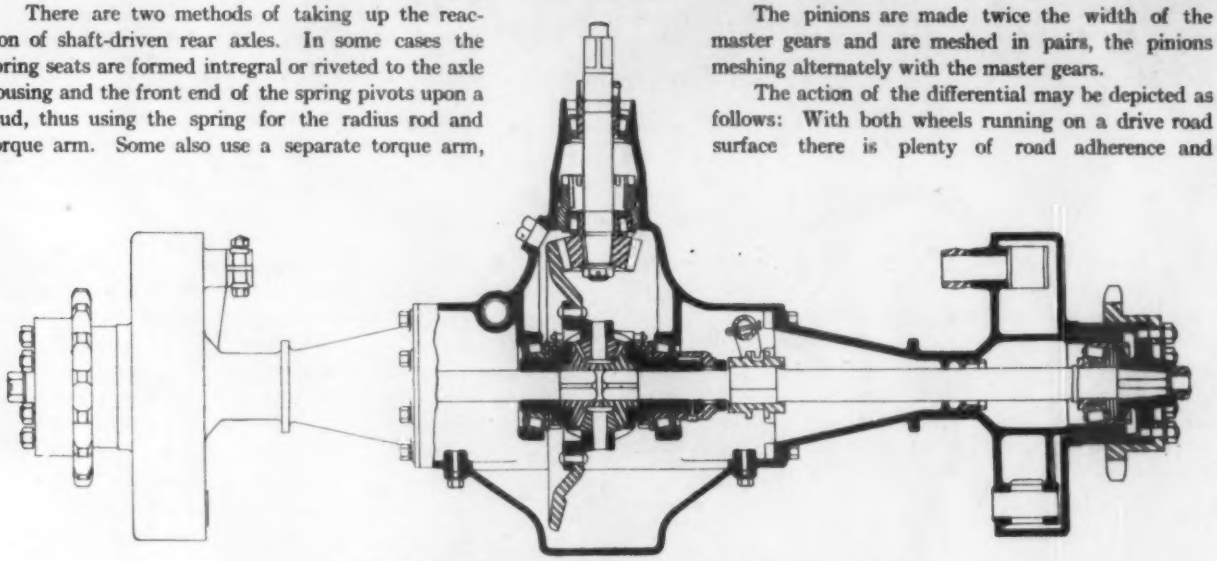


Fig. 3. Velie Jack-Shaft Unit Provided With Differential Lock

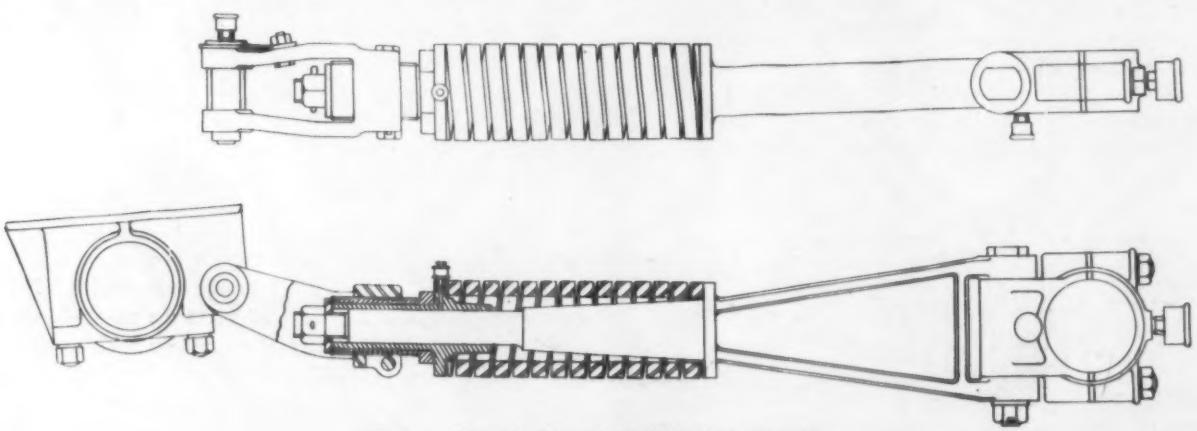


Fig. 4. Velie Radius Rod With Spring Buffer

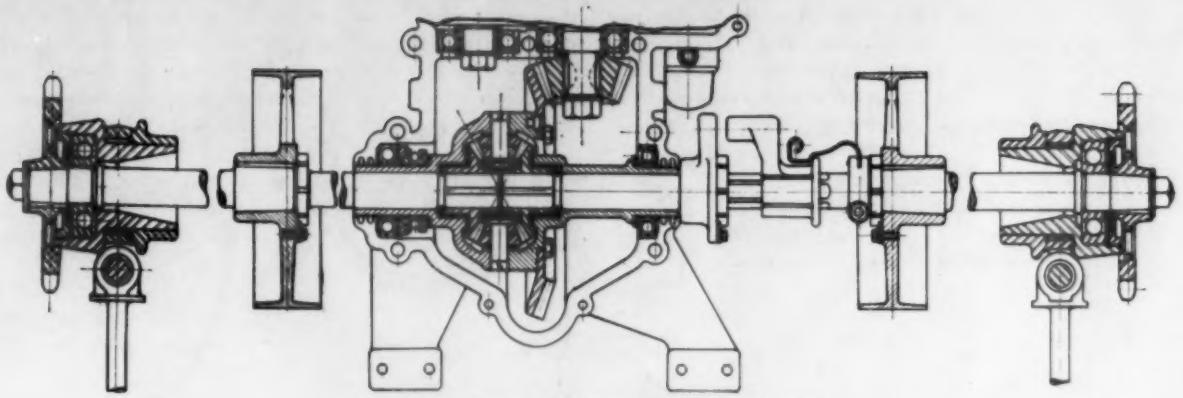


Fig. 5. Jack shaft Built in the Transmission

effort between the two wheels, and the road wheel, which is on dry surface, cannot exert any more propelling effort than the wheel which is on the slippery road surface.

In order to overcome this defect commercial car builders have provided differential locks, consisting of some means for so connecting the two master gears of the differential, that they must rotate in unison.

Fig. 1 depicts the radius rod and rear axle built by the Sheldon Axle Company, which is used on the Harvey, Hercules and numerous other commercial cars. The rear axle center is of rectangular section having the spring seats forged integral, while the spindles are fitted with Standard taper roller bearings. Steel wheels for dual tires are depicted, while some makes use wood wheels which are interchangeable with the steel wheels. Two sets of brakes are mounted in the rear wheels, both acting on a single drum, one set being of the internal expanding type, and the other of the external contracting type. These brakes are supported by a bracket which pivots on the axle spindle and forms the rear support for the radius rod.

These rods are of the full universal type, pivoting latterly on the brake support and jack shaft bracket. They are free to pivot radially about the jack shaft center, while the forward end of the rod pivots in a fork to remove all twisting strains.

Fig. 2 shows the jack shaft used with this type of rear axle, this jack shaft being a separate unit provided with a flange to which the transmission is bolted. The differential is of the bevel gear type while the working parts are mounted on New Departure double row ball bearings. A feature worthy of attention in this and most all other constructions is the method of mounting the differential and gear together with their bearings in a unit so that they can be removed or inspected through the large inspection cover opening.

Fig. 3 illustrates the Velie construction in which the transmission and jack shaft are mounted seperately. Like the Sheldon construction the driving unit is so arranged that it may be removed through the inspection cover opening without removing the jack shaft unit from the chassis. On the right hand side a four jaw clutch is keyed to the differential housing while another clutch is keyed to the drive shaft, but is free to be slid into mesh with the permanent clutch on the differential housing, thus forming a means of locking the differential gears, the operation of this clutch being through a suitable linkage from the driver's seat. Internal expanding brakes are provided, while the outboard bearing for the sprocket is mounted as close as possible to the chain center, the object being to overcome the high tension in the chain on low gear.

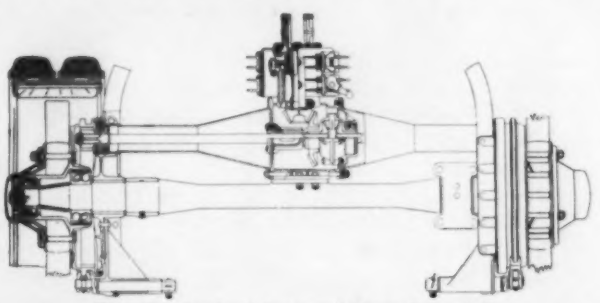


Fig. 6. Garford Internal-Gear Rear Axle

Fig. 4 depicts the Velie radius rod which is also of the universal type, but differs from the one depicted above in that heavy coil springs are used to absorb abnormal shocks due to suddenly throwing the clutch or when backing up to a curb. The rear axle is of round section, and the radius rod pivots upon the axle spindle, while the jack shaft bracket forms the forward support for the rod. This construction of radius rod is also used on the Atterbury and Lewis commercial cars.

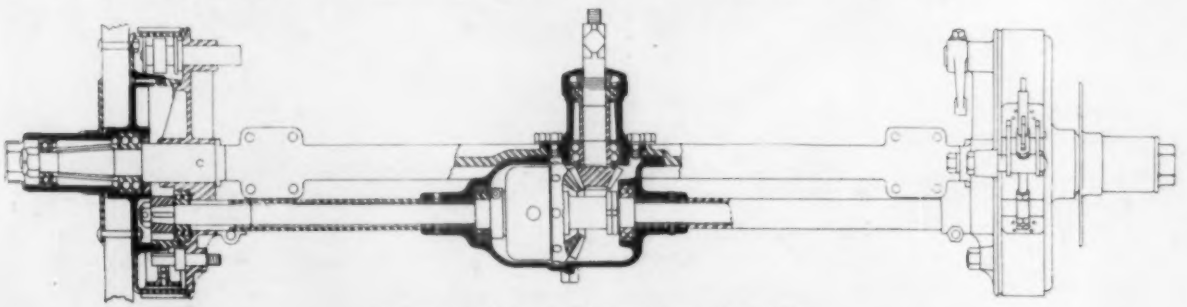


Fig. 7. Torbensen Internal-Gear Rear Axle

Fig. 5 shows a construction in which the bevel gear differential and driving gears are mounted in the change gear case, while the driving shafts are supported by ball bearings mounted in housings attached to the frame side members. Both brake drums are placed inside of the frame, being keyed to the drive shafts, while external contracting band brakes are used, being supported from the frame cross member, which supports the rear end of the transmission. With this construction the brakes are better protected from mud and water, while accessibility is sacrificed to some extent. A differential lock is also provided, so that both rear wheels may be rotated at the same speed in case one wheel should happen to be on slippery road surface. This construction is used on the Alco, Adams and several other trucks.

Fig. 6 shows the internal gear drive rear axle used on the Studebaker commercial cars, the weight of the vehicle being carried on a dead rear center upon which the wheels and their bearings are mounted. A driving unit consisting of the bevel gear differential, driving gears, universal joint member and drive shafts, is attached to this rear axle, the wheels being driven through spur pinions attached to the drive shafts and internal gears cut integral with the brake drums which are bolted to the wheels. This driving unit is similar to the jack shaft of the double side chain drive and is generally termed a drive shaft. Two separate brakes, provided with ribs to facilitate heat radiation, are placed on the drive shaft, while an external brake is provided on each wheel and controlled through a separate hand lever, making a total of three separate brakes, all of which are provided with adjustments. The springs pivot on the rear center and carry the weight of the vehicle and load only, while two large pressed braces are anchored to a frame cross member and take the reaction of the axle and brakes.

Fig. 7 shows the Torbensen internal gear drive axle. The method of driving the wheels is similar to the construction depicted above; however, in this case the jack is placed in the rear of the dead center, while double rear wheel brakes are provided. The internal gear is bolted to an extension of the wheel hub, this being necessary as the brakes are of the internal and external type. This axle is used on the Brown commercial cars, while the Mais commercial cars are also equipped with internal gear drive axles.

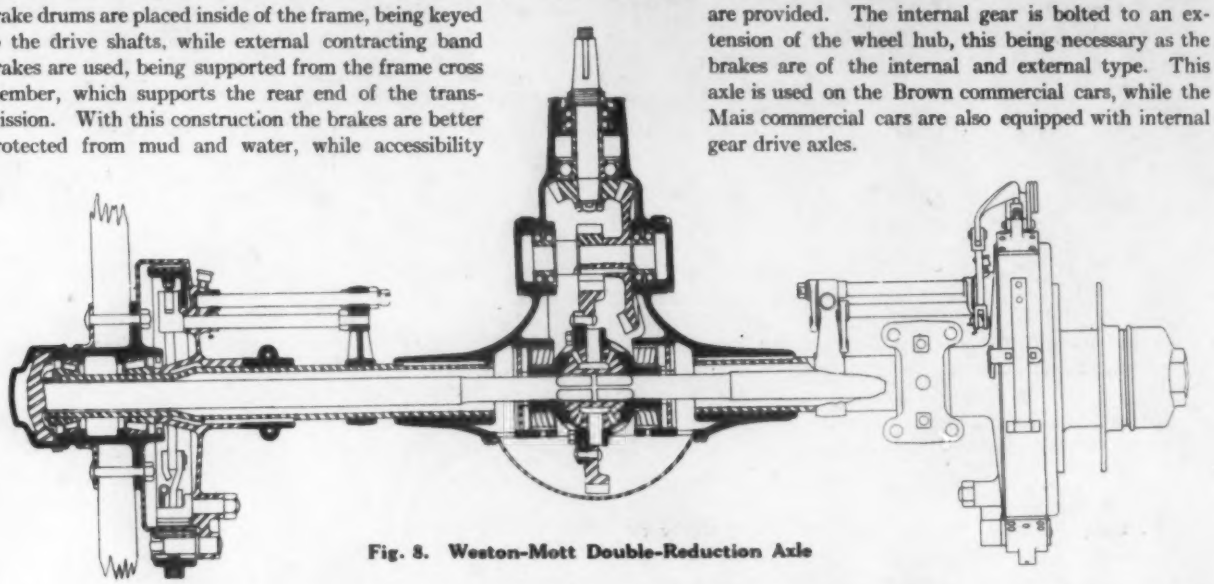


Fig. 8. Weston-Mott Double-Reduction Axle

Fig. 8 shows a double reduction rear axle recently placed on the market by the Weston-Mott Company. It is of 1 ton capacity and used on the Buffalo electric and Flint Wagon Company models. The general construction of the bevel gear differential, drive shafts, hubs and brakes is similar to the bevel gear rear axle of pleasure cars. All parts are, of course, materially increased in size to withstand the vibration on solid tires. The propeller shaft carries a bevel driving pinion which meshes with a bevel gear mounted on a short counter shaft parallel to the axle. This counter shaft in turn carries a spur gear pinion, which meshes with a spur gear attached to the differential gear housing. The propeller and counter shafts are mounted upon New Departure ball bearings, the differential upon Hyatt roller bearings and the wheels upon Standard taper roller bearings. The axle is of the full floating type and provided with two sets of brakes.

The Autocar and 1½ ton White commercial cars also use the double reduction type of rear axle. The Autocar construction being depicted in Fig. 9, differs from the above, in that the counter shaft is placed above the axle instead of in front, while the White construction differs from these, in that the spur gears are on axes at right angles to the axle and the bevel gears are in the customary place. The propeller

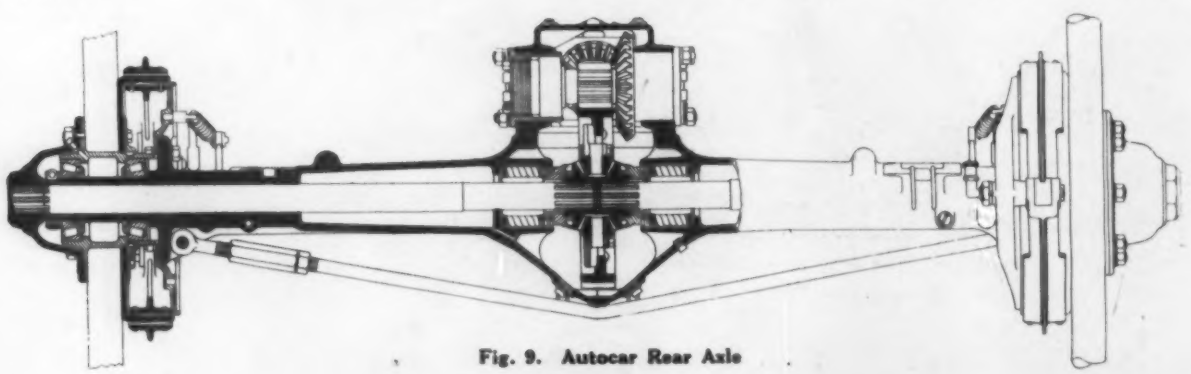


Fig. 9. Autocar Rear Axle

shaft, with its spur pinion, is above the short shaft carrying the spur gear and bevel pinion.

In the Menominee, the spur gear reduction is formed integral with the rear of the transmission, while the usual type of bevel gear rear axle is used. Fig. 10 depicts this spur gear reduction.

Fig. 11 shows the worm drive rear axle used on the Pierce 5 ton trucks, the axle being of the full floating type with the worm mounted above the wheel. The differential is of the spur gear type mounted upon ball bearings and forms a unit with the worm and wheel, being mounted on the cover plate of the housing, so that entire unit may be removed for inspection and repair. The wheels, carrying dual tires, are provided with Timken roller bearings, which are mounted upon tubes set into the axle housing. One set of internal expanding brakes is mounted in the rear wheels, while the service brake is placed in the rear of the transmission.

Fig. 10. Menominee Spur-Gear Reduction Incorporated in Transmission

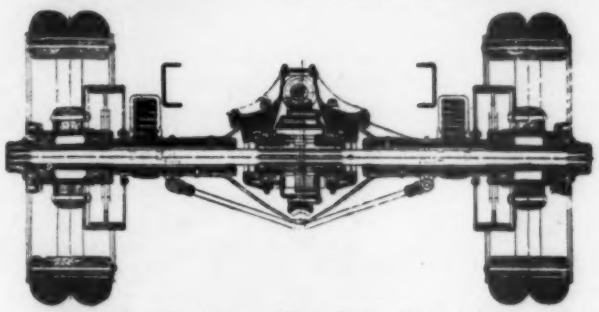


Fig. 11. Pierce Worm-Drive Rear Axle

Fig. 12 shows the worm drive used on the 1 ton Universal truck, the construction being similar to the one depicted above; however, the illustration serves to show the method of mounting the worm and its bearings.

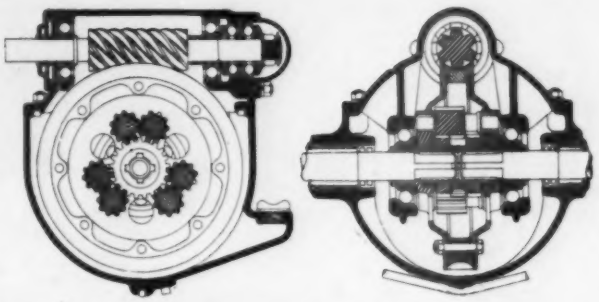


Fig. 12. Universal Worm-Drive Rear Axle

The worm drive axle is also used on the Smith Milwaukee, Blair, Diamond T, Suburban, Schacht and several others.

The double side chain type of final drive is still the most popular and holds its own by good margin, as it possesses an advantage in changing gear ratios and providing a minimum of unsprung weight; however, since it is more troublesome and less efficient than the bevel drive of pleasure car, it can readily be seen that manufacturers are endeavoring to develop a more efficient final drive, which accounts for the large number of shaft driven models on the market at present.

From the illustrations it can readily be observed that the final drive of commercial cars is still a long way from the standardization observed in pleasure cars.

LARGE LINCOLN COMMERCIAL CAR SHIPMENT TO PACIFIC COAST

The Lincoln Motor Car Works, Chicago, Ill., recently shipped 150 light delivery cars to the Pacific coast. A train of twenty-four, 50-ft. box cars, almost a quarter mile long, was required for this shipment. The destination was Los Angeles, Cal., after which several carloads were shipped to San Francisco, Portland, Ore., Seattle, Wash., and Vancouver, B. C.

Peerless Lumber Truck

This truck is being loaded by a special quick-loading device for lumber, and has in a year covered 10,175 miles of soft dirt roads, hauling a daily average of sixteen tons of lumber, with an average mileage of 65 per day. The special loading device is removable in that the load can be moved from the wagon to the truck by one man. The truck is owned by W. S. Van Clief, of Port Richmond, Staten Island, New York.

GARFORDS USED BY NEW YORK CONTRACTING COMPANY

The T. A. Gillespie Company, one of New York's largest contracting concerns, is a thorough believer in motor trucks and uses them extensively in all its operations. This company is using a fleet of five Garford trucks in its work on the new concrete viaduct running through Astoria, L. I. This viaduct is one of the links in the railroad system connecting the Pennsylvania Railroad in Long Island City with the N. Y., N. H. & H. Ry. in the Borough of Bronx, New York City.

All the building material—sand, cement and gravel—is carried from the docks at Astoria to the viaduct site, a distance of two miles. And in those two miles every kind of road bed is encountered from rough cobblestones to thick, sticky clay, yet these trucks keep going, rain or shine, winter or summer.

SALE OF FIRE HORSES MARKS AUTO ERA IN SAN DIEGO

The recent auction sale of fire horses in San Diego, Cal., marks the progress of that city's fire department from a horse-drawn to a motor driven equipment. The steamers are being fitted to travel as trailers behind gasoline motors, and it is the intention of the fire chief to dispense with horses entirely during the year.

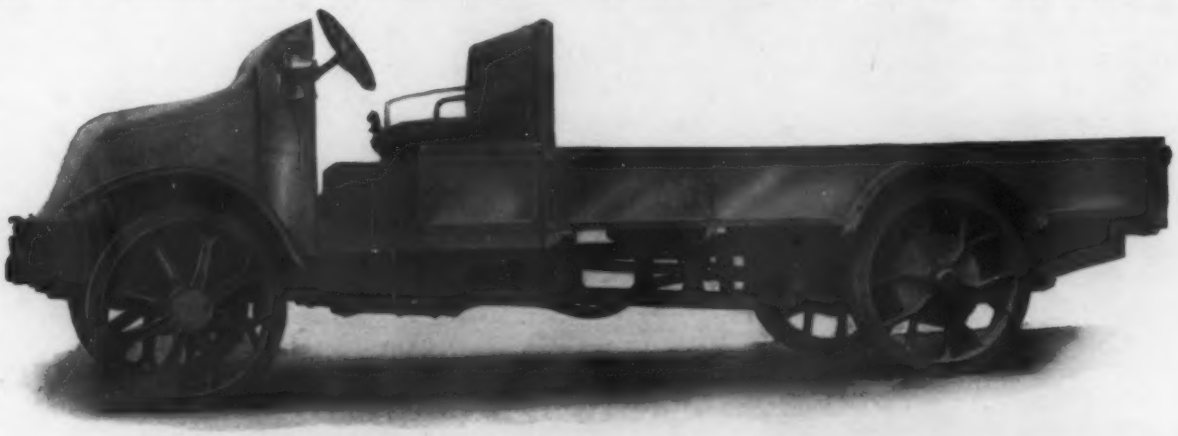
An Unusual Feature Design: A British Two-Tonner With Double Bevel Drive

By OUR FOREIGN CORRESPONDENT

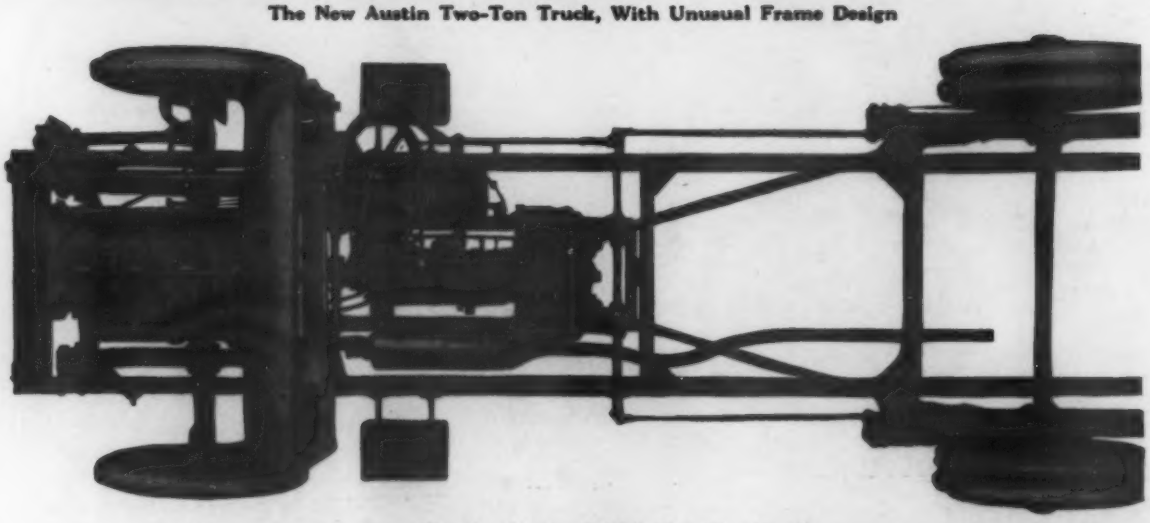
IT is a far cry from the present day to the little Wolseley car that won premier honors in the British 1000 miles trial of 1901, but all that time Herbert Austin, the designer of that vehicle, has been closely connected with the motor trade, to which he has contributed much originality of thought. Yet never before has his novelty of treatment been stamped so strongly on a design as in the 2-ton vehicle that this firm, The Austin Motor Company, Ltd., of Northfield, Birmingham, has just brought out.

Apart from minor details, such as the avoidance of projecting hub caps, unusual spoke design of front steel wheels, the position of irreversible steering gear at the front of the frame, and separate castings to each cylinder, there are three features of most unusual, indeed almost unique, interest.

The first of these is the deep open girder frame, description of which is rendered unnecessary by our side-view illustration. Closer study will show that the chief object of this has been to afford a low position of loading platform. For



The New Austin Two-Ton Truck, With Unusual Frame Design



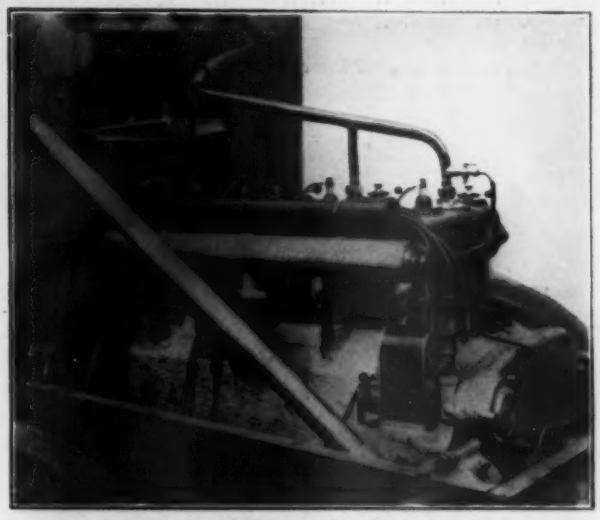
Chassis, Austin British Two-Ton Truck

The radiator is located at the dash, under the cowl. The transmission is suspended on a subframe amidships and by means of special construction, drives two shafts, which through bevel gears, drive the rear wheels

Back-Axle Detail
The upper and lower springs shackled to the same bracket can be seen, as also the casing of the final bevel transmission

the second—the double bevel drive—the same remark, applied to the plan view of the chassis, is sufficient. The object of this transmission is to combine the advantages of side chain and shaft drives, and it is claimed that with this system of power transmission, while the full clearance of the chain driven axle is possible the principal advantages of the live axle transmission are retained. The third outstanding feature is seen in the spring arrangements of the back axle, on which the frame is supported at each side by two springs, the one above, the other below the axle, this arrangement rendering radius and torque members alike unnecessary. The position of the front axle springs within the longitudinals of the frame, deserves notice, for this modification allows an exceptionally big lock to the front wheels.

With the remarkable transmission arrangements adopted the gear box is incorporated in one construction with the short counter-shaft, the complete casing being supported on a channel steel sub-frame, while the usual British arrangement of having brake and change speed levers on the right of the driver has been modified, the latter being now placed on the driver's left. To those who have driven under British road



The Engine of the Austin Truck
With water-jacketed intake manifold. Note the unusual position of the steering gear at the front of the frame

conditions, such a disposition of the control arrangements will appeal as an advantage, while the more compact arrangement of the selector mechanism is also an improvement. The arrangement in the chassis of engine and gear box alike has been designed to afford a maximum of accessibility, and a minimum of difficulty in the removal of these parts.

Five Years Improvement in Working Costs

SOME time ago a description of the Tilling-Stevens gasoline electric 3-ton chassis was given in the COMMERCIAL CAR JOURNAL, and subsequent developments make it look as if the gasoline electric principle might have considerable influence on the future of the heavier types of motor vehicle.

On the face of it, it looks as if the gasoline electric idea ought to offer distinct advantages over gear transmission for the heavier types of commercial trucks, but hitherto the principle has hung fire. The experimental designs of the early days were not entirely successful—that could hardly have been expected—and the early gasoline electrics, what, with burnt out armatures and so forth, did not come up to the promise, and so was not as widely adopted as the intrinsic merits of its principle deserved. But the design that is most in evidence in Great Britain—one might say in Europe—at the present time has the advantage of being able to draw upon an unrivalled experience in practical road working, for Messrs. Thomas Tilling, Ltd., who contribute the first of the two names responsible for this design, operate one of the largest motor 'bus services in the country, and at present, in addition to various hire vehicles, are running over one hundred of these gasoline electric omnibuses in London.

They do not, however, confine themselves by any means to omnibus work. Besides owning a very large jobbing business for the hiring out of luxurious cars and even motor ambulances, they do a great amount of transport work with automobile trucks, and indeed run many of the most important road motor services for the British Post Office. For this work the gasoline-electric system has not yet been adopted, and as Tillings have been running cars since the earliest days (indeed some of their passenger carrying machines were among the first to be licensed in London) the trucks and vans are of a much older type than the 'buses.

Bearing in mind the different conditions in the two cases, comparison of the running costs of these older gear driven trucks with the new gasoline electric 'buses is instructive in indicating the very decided advances that have been made in the design of the 3-ton class of vehicle during the last three or four years. For these figures, the writer is indebted to Mr. Walter Wolsley, managing director of Thomas Tillings, Ltd.

To begin with, the older gear-driven 3 ton trucks, the figures refer to a fleet averaging between 40 and 50 vehicles, and are based on the assumption of two cents, being equivalent to a penny.

Running cost inclusive of maintenance, tires, vehicle lighting, gasoline and driver's wages	$ .1550
Depreciation, insurance, rates, taxes, garage lighting, water charges and telephone charges	.0304
Body up-keep	.0006
Total cost per mile	$ .1860

The average daily journey of each of these vehicles works out to be about 60 miles.

Now let us turn to the gasoline-electric 'bus costs.

Running charges, including repairs, garage and depot, staff and establishment charges	$.02326
Tires	.02250
Driver's wages	.02504
Conductors	.01680
Gasoline, 7¾ to 8 miles a gallon	.02108
Lubricating oil, grease and kerosene	.00244
Lighting	.00112
Depreciation, insurance, rent, rates, taxes, head office establishment charges and supervision, water and gas charges and garage lighting and telephone charges	.01678
Trade vehicles, depot lorries	.00222
Body up-keep	.00542
Traffic expenses (ticket inspectors and so forth)	.00408
Total cost per mile	$.14074

It may be explained that the lighting is afforded by the acetylene preparation, known as Carbic, and further, that both these series of figures refer to last year, and that under altered conditions of 1913 they will be somewhat modified.

Gasoline having gone up in price some 40 per cent. would probably average $.015 a mile more, while the present more favorable tire prices would mean a reduction of $.0025 under this head.

Now let us compare these gasoline electric 'bus costs with those of the gear driven 'buses operated by Messrs. Tillings up to the beginning of 1909. These old costs are as follows:

Running	$.03214
Maintenance	.02338
Tires	.03000
Drivers	.02490
Conductors	.01794
Gasoline	.02178
Lubricants	.00572
Grease	.00132
Paraffin	.00100
Vehicle lighting	.00272
Body up-keep	.00648
Traffic expenses, insurance, rent, rates and taxes, water, gas, etc., supervision, depreciation, telephones, establishment charges, etc.	.03474
Total cost per mile	$.20212

Comparison shows a reduction of $.06138 in working cost per mile between 1908 and 1912, while if we assume the conditions prevailing this year, and so add $.01125 (for increased price of gasoline, less decreased cost of tires) to the 1912 total, we still find a reduction of $.05013 in total working expenses.

So much for omnibus working in heavy traffic. In operating trucks and vans, especially on long distance mail contracts, there is far less brake application and gear changing and it is in this constant stopping and starting work that the gasoline-electric is showing that it especially excels. Indeed it is in repairs that the chief reduction of cost has been made. As a matter of fact it is impossible to start these gasoline electric vehicles with a jerk, nor does the driver even touch his controller, the vehicle being governed entirely by the throttle, which at speeds of below 300 r. p. m. cuts out. Although the gasoline-electric influence is at present felt more in 'bus than in truck work, it is likely to exert a big influence in this latter direction before long, for the lessened stresses on the mechanism enable a vehicle of exceptional lightness to be produced. Indeed, the 3 ton sized chassis only weighs 2 tons 8 cwt. (British tons of 2240 lbs.), and this obviously means lighter running expenses all around.

As a matter of fact it is assumed, on the analogy of the motor 'bus costs, that the gasoline-electric truck ought to show a saving of at least four cents to the mile over the truck costs given at the beginning of this article. Even if we make an allowance for the enhanced price of gasoline, allowing also for lessened tire costs, there is every prospect yet of seeing a substantial saving of at least three cents to the mile under the present adverse conditions. In saying this, the writer is not discussing a problematic proposition, but one based on the fact of the actual results shown by a large number of these machines over extended periods.

What Commercial Cars Are Doing For British Users

TO keep in real touch with such a movement as that of the commercial car, it is very essential to know what the vehicles are doing on the road; only he who wears the shoe knows where it pinches; to this end, therefore, the writer has been devoting considerable attention to the experiences of users who have been running commercial automobiles long enough to form soundly based conclusions.

The first firm upon which I called was Allen & Hanbury, Limited, whose fame as manufacturing chemists is probably well known on your side. This firm have been using the automobile in their business almost since its earliest days. They began with two 16 h. p. Albion vehicles each capable of carrying 2 tons, and since then have acquired five more cars, one of 5 tons capacity and 35 h. p., one 3 tonner of 25 h. p., one 2½ tonner of 18 h. p., a 30 cwt. 14 h. p., and a 15 cwt. 12 h. p. van—all De Dions.

When Reginald Hanbury, to whose courtesy I am indebted, was asked how he found automobiles to compare with horse transport, he informed me that comparison was very difficult becausetheir cars had not only taken the place of the horse, but of the railroad as well. The work is, in the main, fast country wholesale delivery work to doctors and druggists, and even after allowing for the equivalent of railway service they still found the automobile on an average could do more than twice the work of a pair horse van.

The greatly increased range of action too, is a great advantage. Formerly Sutton, a place about fifteen miles out from London, afforded the limit of delivery by horse vans; now, with motors their delivery area is extended to Southend, some forty-five to fifty miles to the east of London, and to Portsmouth, about seventy or more miles to the southwest. The 5 tonner, however, is used regularly between the firm's works at Ware and their headquarters in London, on which employment it easily transports 5 tons, 90 miles a day.

Though I was unable to obtain any working costs, Mr. Hanbury admitted that they had found motors cheaper than horses for delivery work, apart from the advantage of increased trade development. While some firms have hired motors with not very satisfactory results, Allen & Hanbury have preferred working their own vehicles, and in this they have obtained entire success.

One point of some value to designers, was made by Mr. Hanbury when he gave as one of his reasons for employing De Dions, that parts, such as gear boxes and so forth, were comparatively light and did not entail special lifting tackle when dismantling the car.

The Allenbury Team
All these cars have done sterling service, and are showing excellent financial results, some after many years service

LAUNDRY TRUCK DOES WORK OF THREE WAGONS

The Gleniffer Laundry, at Catford, a suburb of London, is run by Messrs. A. Bell & Sons, who have been working automobiles for a considerable time past. They employ five cars; one 2 tonner, two 30 cwt. vans, and two light delivery vans. The first three of these are Commer Cars, the last two old Panhards, and all are run entirely on solid tires, except the Panhards which have pneumatics on their front wheels.

On laundry delivery work they find these cars average 50 miles a day—less in the crowded traffic area of London, more in the country, but the country delivery work is decidedly more advantageous, for the delays of the congested traffic of London run away with time and gasoline, which they are obtaining at 30 cents to the gallon. One car they find will do more work than two, and sometimes more than three horsed vans of corresponding size.

For laundry work in which the deliveries are made in baskets or hampers, specially large bodies are desirable for the goods are light for bulk, and when getting a van they say that it is necessary to have a very definite idea, not only of the size of the hampers and their arrangements in the body, but of how loading and unloading is going to be done, so that deliveries can be taken out in the order in which they are required. It is usually found best to arrange the hampers in two rows down the length of the body, each row being double tiered.

Another firm that will need little introduction on either side of the Atlantic—Bryant & May, Limited, whose matches are known all over the world—have been using the commercial automobile from its earliest days, for as far back as 1902, they were employing mechanical transport in the shape of a steam tractor. This, however, was hardly suited to their work, for they use motor transport exclusively in town deliveries in London and its suburbs. It is this class of work that was most expensive in horse flesh, for on this work, the average life of a horse was only three or four years, and the two horse vans used averaged in cost the equivalent of 19.2 cents to the ton-mile. All these horsed vans, however, were replaced by automobiles eight years ago, and though, in this town working, speed of the motors is severely handicapped by traffic, their greater handiness in taking advantages of openings, and the less road room that they require has been found more than adequate compensation.

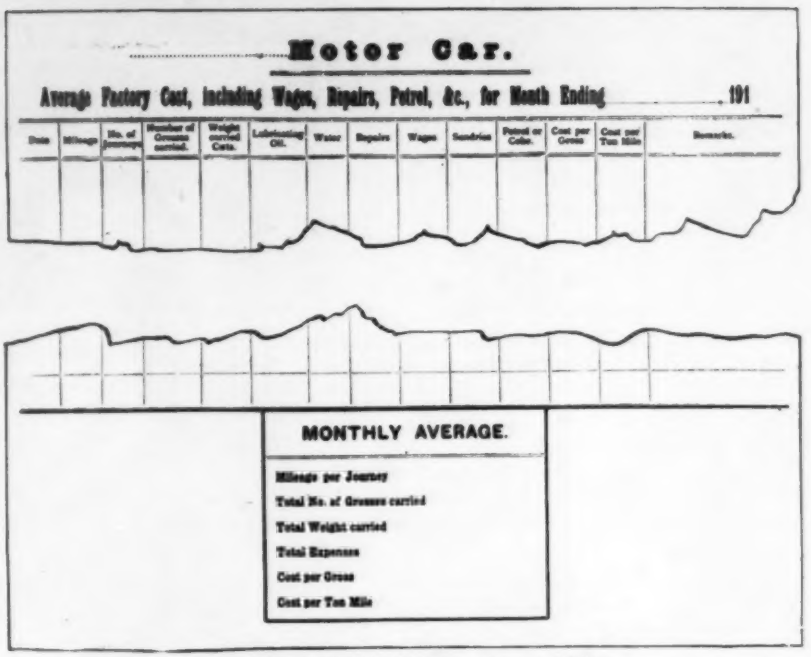
To provide for repairs, renewals and depreciation the firm make a practice of writing off $12 a week, which has been found ample for the purpose.

As a comparison with the 19.2 cents per ton-mile for the horse transport, Messrs. Bryant & May very kindly afforded me figures relating to the working of their motors, but it should be understood that, as each of these was on different work, involving quite separate conditions, these cannot be regarded as comparative between one car and another. All the five cars they employ have a load capacity of about 25-30 cwt.; three are Argylls, one is an Albion, and one a Lacre. Their No. 3 van averages 31 miles daily with a mean load of 15 cwt., and with a gasoline consumption of 11 miles to the gallon, the cost per ton-mile works out at 17.4 cents.

No. 4 travels 24 miles a day with an average load of 14 cwt., and a consumption of 11 miles to the gallon. As this, however, is used as a spare car, it is not employed as economically as if on regular work, and the cost to the ton-mile comes out at 18.8 cents to the gallon.

The No. 5 van averages 30 miles with a 15 cwt. load, and a consumption of 14 miles of gasoline to the gallon. On this basis, it costs 15.5 cents to the ton-mile. The method that the firm adopted for keeping their records is indicated by the accompanying table.

It will be noted that the average mileage in all these cases is exceedingly low, owing to the special conditions of working, yet even then, we find a material economy, quite apart from the saving in time which cannot very well be reduced to figures. If such vans were used on such point to point deliveries, undoubtedly, the ton-mileage figures of the cars would be far lower, and would show a very much more marked economy as compared with horse transport. Yet, although the figures above are not striking compared with most, they are yet sufficient to show a material saving over horses, and that, under circumstances which are unfavorable to the automobile.



Record Sheet Used by Messrs. Bryant & May

THE COMMERCIAL CAR SUPPLANTING RAILWAY

The British railway strike of 1911, and subsequent unrest in the labor world, has involved railway companies of the United Kingdom in raising their transport freights to cover their higher wages bills. The draught of these higher freight rates is beginning to be felt by manufacturers, but it is an ill wind that blows no one any good, and it is making the British manufacturer and business man look to the possibilities of the commercial car.

It is typical of the general attitude of the manufacturers that a member of the Blackburn Manufacturers' Association recently expressed the opinion that the new railway freight rates would undoubtedly extend the use of the utility automobile. His own Association had been experimenting with motor transport, and found the experiment justified the expense. Manufacturers had found that a more prompt delivery was possible by motor than by railway, and he predicted that the higher railway rates would lead to the formation of very large road transport organizations in Britain.

AUSTRIAN TIRE INVENTION $10,000 COMPETITION

The Austrian War Department in their desire to obtain more inexpensive tires suited to their requirements, are offering a $10,000 prize for an elastic tire suitable for military automobiles. What is wanted is some sort of tire that will be cheaper to run and cheaper to buy than the ordinary solid rubber tire, and yet be at least equal to it in resiliency and freedom from side-slip. The competition is international and intending competitors should send in drawings, descriptions and models or full sized specimens of their inventions before the first of October next, to K. K. Versucsattheilung, Gumpendorferstrasse, Vienna VI.

"Virtue consists in action,"---keep your trucks moving

The Green Hand

By LEN. G. SHAW

MERKEL was new to the auto truck business. A point in his favor was that he laid no claim to being anything else.

In tones loud enough so that the victim would be sure to hear, Clarken, mechanical expert for Dorr & Willis, asserted that Merkel was so green he didn't know a cotter pin from a crank shaft. But he revised his estimate upward that very day when, after he had cranked himself black in the face in an endeavor to get a stubborn motor to turn over properly, Merkel suggested in quiet tones that perhaps a little gasoline in the tank would help matters, and he found upon investigating that the supply was exhausted.

Thereafter Clarken was less outspoken in his opinion of the newcomer. In fact, on several occasions he so far descended from his superior position as to drop a word or two of encouragement.

Merkel had been a "jumper" on a horse-drawn delivery wagon. That proved too commonplace, with nothing in view for the future, and he announced his intention of allying himself with the motor truck business. He was so persistent in his pleadings for a chance, that Dorr, senior member of the firm of Dorr & Willis, finally decided to make a place for him in the garage, where he could learn the mechanical details.

Within a week there was not a machine around the place that he could not run like a veteran, and Clarken, who had finally taken a marked fancy to him, declared that his protege could take a truck apart and put it together again; this opinion being voiced privately.

Then it was that Merkel presented himself in the front office and announced that he was ready to start out as a salesman.

Dorr smiled good-naturedly when this statement was vouchsafed. Willis, who had grown up in "the game," as he always referred to it, and who, although still a young man, was backed up by years of experience, failed to see the humor of the situation.

"Every auto truck dealer in Dansville had essayed to interest him in the subject, only to be turned down cold."

"We'll take the matter up and let you know," he announced, when he had recovered his power of speech. "In the meantime, you'd better stick to the shop."

"Did you ever see such assurance?" inquired Willis, when Merkel was gone.

Dorr chuckled softly, as he stroked his chin.

"He's not lacking in nerve," he admitted. "If that is all that's needed to carry him through he ought to lead the parade."

Willis toyed with his watch guard for a minute before continuing the conversation.

"It's unfortunate, too," he said, half to himself. "Just now is the critical time. It is either make or break with him. What he really needs is a lesson to take some of the conceit out of him."

"Why don't you teach him such a lesson, if you think it would do him good?" inquired Dorr, displaying increasing interest in the turn affairs were taking.

"How?" countered Willis.

"Hm," mused the non-plussed Dorr. "Hm. Oh, most any way. Give him something to do that will show what kind of stuff there really is in him. Say—why don't you set him on old man Scott. He's about as cold-blooded a proposition as you could find."

"Done," exclaimed Willis. "Capital idea. We'll send him up to sell Scott a truck. If he lives to get away he'll always remember the experience."

Whereat Willis laughed immoderately at the prospect.

Scott was the fly in the ointment so far as the local truck field was concerned. Every auto truck dealer in Dansville had essayed to interest him in the subject, only to be turned down cold in the end.

Scott was head of the largest department store in Dansville. An order from him would mean not a little in the way of prestige. But so far all attempts had met only with a rebuff. Horse-drawn vehicles were good enough for him, he argued, and that ended it.

Merkel accepted the assignment with an unmistakable air of gratitude that made Willis waver for an instant in his determination. Then he argued to himself that what he was doing was all for the best, so far as Merkel was concerned.

"How are you going to approach him?" inquired Willis, at the conclusion of the interview.

Merkel smiled blandly.

"Oh, I'll arrange that all right," he said. "But I want to be free to do as I see fit, so long as I do not obligate you in any way."

"That will be all right," said Willis, striving to repress a smile. "You can do just as you please."

Nothing was seen of Merkel the next day, or the one following. Clarken swore volubly when he found what his protege was up against. Dorr expressed the fear that Merkel had become discouraged, and Willis began to think perhaps he had been unnecessarily severe. Then Merkel showed up smiling.

"I want to borrow a truck and a driver for a half day," he announced, not one whit abashed by his two days' absence.

Again that bland assurance carried the day. The truck and driver were forthcoming, although the firm were opposed to free demonstrations of any sort.

"This isn't going to be a free demonstration," volunteered Merkel, as if to ward off any objections on that score.

When the truck returned to the garage at noon Casey, the driver, expressed the belief that Merkel was "off in his noodle."

"Of all the fool drives I ever made that was the craziest," he declared. "Up one street and down another, with that crazy Merkel making me stop every little way, while he was figuring on a piece of paper. And not a thing on the truck but the two of us."

Clarken listened to the recital in silence. If he had any misgivings he discreetly kept them to himself.

"He's no fool," was his only comment, when Casey appealed to him.

At four o'clock that afternoon Merkel entered the office of Dorr & Willis, and addressed the senior member of the firm.

"Mr. Dorr," he inquired, "how quickly can we supply Mr. Scott with two trucks?"

Dorr looked up with a twinkle in his eyes. When he saw the serious expression of Merkel's face his attitude changed.

"Wait a minute, Mr. Merkel," he said. "Mr. Willis just stepped out into the garage. He will be back in a moment."

Just then Willis entered.

"Hello, Merkel," he said, cheerily, "how did you make out?"

"Mr. Merkel wants to know how quickly we can supply Mr. Scott with two trucks?" interposed Dorr.

Willis smiled.

"As quick as he is ready for them," he said, with a laugh. "Do you think we had better send them over tonight, or can he wait until morning?"

Merkel paid no attention to the thrust.

"I sold him two trucks this afternoon," he said, unconcernedly. "If they make good he will take six more. Here is his check as a guarantee."

Dorr and Willis looked at each other blankly, then at the check, and finally at the man who held it.

"Do you mean to tell me you sold Scott two trucks?" inquired Willis, when the truth began to dawn on him.

"Certainly. Why not?"

"Well of all things. How did you do it? Sit down, Merkel, and tell us about it. How did you hypnotize him?"

"I didn't hypnotize him," protested Merkel. "I just told him what he had been waiting to hear. I spent two days with some of his drivers, making their rounds. I took note of the routes they covered, how many stops they made, the duration of each, and the time spent in driving a horse from one stop to another. Then I picked out the hardest of the routes, went over it with a truck, checked off the time for stops, and for running.

"This afternoon I laid those figures in front of Mr. Scott—the actual saving that he could make with a motor truck—every stop right there, black and white.

" 'Well, by George,' he said, when I showed him what I had, 'I'm glad there's one man has sense enough to give me just what I've always wanted to know. I don't give a whoop about the bore and stroke of the motor, whether the steel in the frame is 3-16 or 3 in. gage, nor how many leaves there are in the springs. What I want to know is what a truck will do when put up alongside a horse—not on paper, but on the road You've done it. It's the first time a truck salesman ever brought me any figures that were worth anything.'

"When we'd gone over the two statements together Mr. Scott ordered two trucks for as early delivery as possible, with six more to follow if the first ones do what they should. He also offered me a position as superintendent of his delivery department. But I declined with thanks. I want to stay here."

"We want you to," chorused the senior and junior members of the firm. "We can use you in our business."

PREMIER TRUCKS IN SERVICE OF TELEPHONE COMPANY

The Chicago Telephone Company three months ago purchased three Premier light trucks to be used for delivering instruments to new subscribers. Their carefully kept records show they have averaged 115 deliveries a day against a delivery of 30 instruments by horse and wagon. In other words, one motor truck does in one day what the horse and wagon did in four days. The delivery cost under the old method was 31 cents; under the new method is 9 cents. This quick installation establishes the subscriber a dividend payer four times as rapidly as the antiquated method, this making a still more economic saving.

KELLY TRUCK COVERS 270 MILES IN 31 HOURS

A one-ton Kelly truck, owned by Hersum & Company, of Boston, recently made a record of 270 miles in 31 hours. This truck left Boston at 9 A. M. on a Monday and drove 130 miles to Hartford, Conn. Arriving in Hartford it carried two loads from one point to another, and then taking on a full load of furniture, returned to Boston. The Kelly arrived in Boston at 4 P. M. on Tuesday.

KisselKar Patent Combination Uniform-Pressure Street Sprinkler and Flusher

A new product of the Kissel Motor Car Company, of Hartford, Wis. It consists of a one thousand gallon galvanized steel tank mounted on a regular three-ton chassis. Pressure is produced by taking water by gravity from bottom of tank into two-stage centrifugal pump directly connected to motor. From twenty to sixty pounds pressure can be had, according to speed of motor. Water is forced from pump into distributing pipes and out through adjustable nozzles for flushing and through two pipes to sprinkling attachments of vehicle type. The same pressure may be had when the tank is partially full as when full. Both the flusher and sprinkler are operated by hand levers, and can be changed from one to the other in an instant. The sprinkler will sprinkle the full width of a 60-ft. street, or can be closed down to 20, 30, 40, or 50-ft. streets, and can be cut off at any time, both sides at once or either side separately, making it possible to sprinkle in a street where the traffic is unlimitedly heavy. One tank of water will sprinkle seven to eight blocks of 50-ft. roadway, or will flush a distance of three and a half blocks.

MORELAND TRUCK USING DISTILLATE MAKES RECORD OF ONE THOUSAND MILES AT FUEL COST OF $7.21

Ever since the motor truck first became recognized as a time and money saver over all other forms of freight transportation in short hauls, the one open question has been regarding its efficacy over long distances and in all sorts of road conditions. It was claimed that while the motor truck was undoubtedly supreme in a purely local field, it could not possibly compare with the railroads when it came to trips which meant mileage over mountains and desert where the wear and tear of the road would develop the least mechanical defect.

Moreland Distillate-Burning Truck

It was with the idea of demonstrating the fallacy of this contention that Watt Moreland, manager of the Moreland Distillate Truck Company, of Los Angeles, arranged the economy run from Los Angeles to San Francisco and return this May, with the Los Angeles and San Francisco newspaper offices as the checking points at each end. Every pound of freight, every gallon of distillate and every quart of oil connected with the trip was carefully weighed and measured, and at each end of the long run was rechecked to guard against question of accuracy.

The trip to San Francisco was made with a perfect mechanical score, and on the return trip the only mishap consisted of breaking a headlight glass, due to hitting a "chuck hole."

The following statement of Watt Moreland indicates the efficiency and economy demonstrated by this motor truck. He says: "Figured right down to the decimal point, the trip to San Francisco and return, 1052 miles, cost less than one-half cent per ton mile, exclusive of the wages of the drivers. The local railroad freight rate, exclusive of handling, is 42½ cents per cwt., so on the very face of it, the truck has shown that it is more economical than the railroad. The truck we used was regular stock wagon taken off our sales floor. It is listed as a two-ton vehicle, but the fact that its dead-weight load exceeded this mark by 500 lbs. did not make the slightest difference."

Barnard Gasifier Used on the Moreland Truck

A detailed record of the two-ton truck carrying 2¼ tons of oil in barrels is here given:

Time to San Francisco, from 5th & Broadway, Los Angeles, 29 hours, 25 minutes.
Time of return trip, 29 hours, 5 minutes.
Total miles (speedometer record), 1052 miles.
Average time per hour, 17.098 miles.
Distillate consumed, 103 gallons.
Miles per gallon of distillate, 10.22.
Zereolene oil consumed, four and a half gallons.
Miles per gallon of oil, 222.6.
Oil cost, 31 cents per gallon, $1.39½.
Distillate cost, 7 cents per gallon, $7.21.
Total cost of fuel, $8.60½.

The Barnard Gasifier

The low fuel cost was made possible by the use of a device known as the Barnard Gasifier, which is designed to heat the mixture after it leaves the carburetor, in this way differing essentially from more commonly used gasifiers that heat the air before it is mixed with the gas. The advantage claimed is that a more even and perfect mixture is obtained this way than by admitting heated air, which might vary considerably in temperature as the engine worked under different conditions. With the Barnard Gasifier, the mixture is heated just before it enters the cylinders, and the temperature is always approximately the same, about 300 deg. F.

The device is a small cylindrical brass casting, about 6 or 8 in. long and about 3 in. in diameter. It is filled with small brass tubes, like a miniature boiler, and heat from the exhaust passes through them. This is placed between the carburetor and the cylinders, and the gas, passing between the heated tubes reaches the proper temperature. The gas being completely burned at each explosion, carbonization is minimized. The hot air from the exhaust is passed through the gasifier, by cutting into the exhaust pipe and attaching a flexible metal tube, 1 in. inside measurement, which connects with the gasifier. Before leaving the shop the device is thoroughly tested, and overheating may be easily corrected by the use of bushings where the flexible tube enters the end of the gasifier, as they will reduce the size of the opening and the amount of hot air admitted.

In connection with this distillate burning system, it is necessary to install an auxiliary tank. This holds about a quart of gasoline. Starting the engine requires only a few drops of the higher grade fuel, just enough to heat the gasifier, and a few revolutions will do this.

Monster Truck Used by Box Manufacturer

The truck illustrated above was built on special order by the Sternberg Manufacturing Company, for the H. R. Gibbons Box Company, of Chicago. The body is 24 ft. long and the truck 29 ft. 5 in. over all. The wheel base is 208 in., and the tire equipment 36 x 5 in. front, 40 x 4 in. dual, rear. The truck is governed to twelve miles per hour, maximum speed.

What's the Matter With the Truck Business?

By A TRUCK SALESMAN

The Buyer

ABOUT four years ago the public first began to seriously accept the motor driven truck as an economic factor in modern efficiency. At that time, and since then, we have been constantly reminded that the "truck" was going to be the big end of the automobile industry. Manufacturers have rushed into the production of commercial vehicles; salesmen have worked like demons to dispose of them; advertisers have called on all the resources of their fertile imaginations; engineers have smashed all the rules of their craft to produce innovations, and still the sale of trucks has not been what was expected.

Instead of being the big part, it is still the very small end of the market for self-propelled vehicles. One year ago firms were investigating this new method, and many were purchasing trucks, so that it looked as if the problem was solved and the truck was going to come into its own. But to-day a blanket of apathy seems to have fallen over many of our business men.

There is never an effect without a cause. Since commercial vehicles are not selling, there are probably many reasons for this state of affairs, some of them more serious than others, and the most serious of all is the unscientific manner in which trucks have been purchased in the past, and are being bought right now, because from wrong buying has resulted wrong administration, and improper use is to-day building a stone wall across the path of truck progress.

Must Distinguish Between Muscle and Machinery

There is nothing so hard as to move a man into new channels of calculation. The men who control business to-day look at their transportation problems in horse figures. They seem to be unable to separate muscle and machinery. They look at a truck as representing so many horses, and they buy it in the same way.

Just imagine what would have happened if the street railways had bought a few trolley cars and mixed them up with the horse cars then operating. Would they have been able to draw any sort of a conclusion as to the efficiency of the modern appliances?

Well, that is exactly the process that is taking place in the sale of trucks. Ninety per cent. of the trucks sold are simply experimented with by the buyers. Men are buying one or two, mixing them up with the same methods used by founders of this country to haul goods and then raising Cain because they don't get anything but confusion and expense. What else can they expect? What else can the truck producer expect? When 1913 is hampered with 1776—nothing but failure—failure from unscientific methods. The local transportation of merchandise has been the last department of modern business to be improved. Ninety-five per cent. of the firms don't know what it costs them to deliver their goods. They tell you they do, but they don't, and, moreover, they are more or less afraid to face the truth of a scientific investigation, because it will show how "horse drawn" their methods have been.

Now, right in this lack of the application of scientific management to this question of buying motor trucks, lies the explanation of the condition of the commercial car market at present. Firms are not buying with the proper and intelligent knowledge of trucks necessary for the successful application of them to their delivery conditions.

Sometime ago a certain brewery in one of the largest cities in the country came into the market for two trucks; one three-ton and one five-ton being the sizes indicated. In about fifteen minutes after they expressed a desire to investigate, there were fifteen truck representatives knocking at the golden gate. Innumerable demonstrations of varied length were given and during the time no member of the brewery had to walk a step, because there were always two or three pleasure cars standing outside the door. Finally, however, proposals were asked for and all comers were told that the matter would be decided at a meeting of the Board of Directors on a certain date, and on the day of days it was a question as to whether the score board or the brewery had the greatest crowd before it. After a while the directors announced that they were unable to decide, but would take it up finally at a meeting one month hence. One month later, it was stated that the question was to be placed before the stockholders. Fifteen days later, owing to a dissenting vote in the directorate, the bidders were informed that the purchase was "indefinitely postponed."

Now the moral of this story is that these men who wanted more modern methods didn't know anything about motor trucks or how to employ them in transportation. They were expert brewers, and they knew all about delivering beer with horses, but when it came down to putting trucks into service, they were working in the wrong way, and they did not present the case clearly to either directors or stockholders. Neither did they seek information in the right way. Instead of tearing their delivery system apart and subjecting the problem to a mechanical solution, they simply took a few demonstration figures and tried to experiment with two trucks where they probably needed ten, or more. In consequence, they were so unprepared to present their case that they lost, and the sale was lost to the truck makers. Moreover, had they bought, it is most likely that the results would have been so unsatisfactory that another bad example would have been presented to other business men.

User Must Get Information

The whole matter resolves itself into the fact that prospects must acknowledge their weaknesses and seek outside aid. System experts change the counting methods. Consulting engineers are brought into every change in mechanical construction, and if truck users are going to buy right, and get the proper results from purchasing trucks, they must throw away their old ideas and let some one who looks in from the outside help them. None of us can do without the other fellow. No one is capable of seeing his own faults clearly until after the blunder is made. Even a physician can't diagnose his own case, or successfully treat his own family. Why then should men imagine that because they now use horses, they are capable of passing on the use of machinery for the same purpose. The methods are as far apart as the lights of day and night.

Another thing the buyer must learn, to trust the men making and selling trucks. Any successful enterprise is built on integrity, and the truck is no exception. To install a commercial car which does not reflect credit on the maker is the worst advertisement a firm can possibly have; yet many are simply forced into this position by the unscientific buyer who installs what is wrong and uses it in an improper way to get desired results.

So let us realize that one of the main reasons why trucks are not selling as they should and why this lack of interest in trucks is now so apparent is because the prospect has not bought right in the past, nor is he buying right at present, and until every one connected with this automobile trade puts his shoulder to the wheel and tries with all his might to show these people how to buy and use trucks, this veil of apathy will hang like a pall over the whole truck situation.

NEW YORK CONCERN RENTS TRUCKS

An idea that is not entirely new, but sufficiently so to be interesting is being carried out by the Atlantic Transportation Company, 1480 Broadway, New York City. The scheme consists of operating commercial cars on rental contracts for firms that have to make deliveries and collections and who do not care to invest in commercial cars of their own. Under a contract of this kind it is possible for a store or firm to have the exclusive use of a truck of the proper size, lettered with their own advertising matter for six days in the week. No investment is required by the lessee and the lessor assumes all responsibility of operation.

The firm claims the following advantages:

1st: No investment required.
2nd: The services of a motor truck at the lowest possible cost.
3rd: The advertising value of a motor truck to your business. It proclaims to your possible customer that "you can deliver the goods" and keep your delivery promises.
4th: No worry over the employment of drivers; we furnish the driver and guarantee that his services will be satisfactory to you.
5th: Breakdown service. In the event of a collision or other damage to the truck another truck of suitable size is immediately sent out and the load transferred.
6th: No damage liability to you.
7th: A clean, well groomed truck that will reflect the enterprise of your house.
8th: Road inspection. We have several men secretly inspecting the work of our drivers to see that they are serving your interests faithfully.
9th: A comprehensive system that tells us where your truck was at any hour of the day, all of which information is at your disposal.

NURSERYMAN FINDS TRUCKS PROFITABLE

Henry A. Dreer, Inc., of Riverton, N. J., is now using two 3-ton Packards and an Autocar. These Packards have the distinction of having the largest bodies in use in the city of Philadelphia. They haul everything from small potted plants to large trees, and make two round trips daily between Riverton, N. J., and Philadelphia, or a daily average of about 50 miles. Mr. Duffy, Superintendent of Delivery, said, "We now ship direct to the railroads and steamboats, saving much

Loading One of the Big Trucks at Riverton, N. J.
The truck is loaded in the morning and deliveries are made in Philadelphia to the consumer the same day

time and re-handling at Philadelphia. Before we had the trucks our stock came down on boats. They were loaded early in the morning, arriving any time between 11 and 1 o'clock, if there was no fog. On foggy days we never knew when they would arrive and often missed railroad or other boat connections. We don't touch the goods now from the time they are placed on the truck until they are put aboard the train or steamboat. We also deliver direct to florists in Philadelphia as well as general deliveries.

"I really don't know how we could do without the trucks. In the winter when the river was frozen we had to haul by horses and could only make one load a day. We now operate our trucks every day in the year and each machine holds fully twice what a team carries. Some of our goods are very heavy, such as cases of palms and bay trees, which weigh as high as 1000 lbs. each. Between seasons we haul small stuff.

"We were often forced with horses to make long hauls in the summer but never knew the next morning whether the horses would be in shape or not. In the congested traffic of the freight stations the horses are all right, but for our long haul work, either in summer or winter, they are not in it with the trucks. We might get along with them in the summer but in the rush season, or during the winter weather, the trucks are much better. During the idle spell the trucks are not depreciating from wear, nor are they using gasoline except when they work, while the horses are eating their heads off. We could not possibly think of going back to old methods."

MOTOR TRUCK AS CROSS COUNTRY SAMPLE WAGON

The salesmen of the A. B. Frank Company in San Antonio, Tex., now use a Federal motor truck to convey the samples on their cross-country drumming expeditions, instead of the usual canvas covered wagons propelled by four-mule power.

Before setting out on the journey the truck is loaded with two thousand pounds of sample provisions, and a camping outfit for two. The expedition proceeds from town to town showing samples and taking orders. These trips are then followed up by another Federal, which delivers the merchandise ordered. Several mule teams are still retained on the delivering journeys and work upon the nearby towns, while the truck reaches the outlying districts.

The truck averages ten miles per hour throughout the entire trip over sandy roads and mountainous trails, touching all the adjacent towns which are not accessible by railroads.

Trips that originally took from two to three months are accomplished in three to four weeks and at a saving of about one-half. The trucks work within a radius of 500 miles, or about three times as far as the mule.

Stewart Trucks in Telephone Service

The New York Telephone Company has just purchased ten Stewart delivery trucks and has contracted for a number in addition. Of the first ten trucks, nine are fitted up as work cars and one as a money car. The work cars are of the express-body type with top. Each car is equipped to carry a number of ladders, coils of cable, rope, extra telephones, tools, etc. These cars are used for hurry-up repair jobs and for quick transportation of men. The money car is of the panel-body type with sliding wire doors at the front. It is used in making collections from the automatic pay stations. Two clerks work inside the car, counting, sorting the money and making records.

Why Contractors Are Not Larger Users of Motor Trucks

By C. A. CRANE, Secretary General Contractors' Association

I have sometimes given a salesman credit for really believing what he said about a car as long as he was selling that particular make, and I think I am only sharing the general belief in stating that the greatest trouble the salesman had was in filling, rather than getting orders.

But the clever salesman is not content—he knows in his own heart he isn't clever when he sells to a man who *wants* to buy. It's only when he can sell to the unwilling purchaser that he is entitled to medals, and that's what he is up against—an unwilling purchaser—when he attempts to sell a motor truck to a contractor. You've got to show the contractor, and from my limited knowledge with the contracting business, I'm bound to say you haven't done it.

The contracting business has more peculiar and varying conditions than perhaps any other. There were never any two contracting jobs precisely alike.

Now I'm speaking of contracting from the standpoint of the contractor—not the material man—for I notice in the announcements published in the motor truck publications that the lists of contractors using this or that motor truck class material men as contractors—and in those lists I have found that of those whom I know, 90 per cent. are material men and *not contractors*, and I assume that percentage is not far off on the entire list.

The material man is governed almost solely by competition; if he can save on haulage he can undersell a competitor. If he doesn't keep abreast of his up-to-date, cost shaving competitors, he wouldn't hold his business, and he must be alive to that fact every minute. With a contractor it is somewhat different—not that competition isn't just as keen—but once he gets the job, the competition ceases.

Now the bid includes a profit—or the contractor thinks it does when he bids—and barring mistakes or accidents, he will make that profit. You come to him and suggest motor trucks instead of horses. He has figured on using horses and that figure is in his estimate. He doesn't know what a motor truck will do, he isn't in a position to experiment for his contract carries a penalty for delays and overtime. Here's a situation for the clever salesman and I think the reason why more are not to convince a man who has a sure thing and nothing to gain but a little more profit, to abandon his plan and perhaps lose all his profit. The superiority of the motor truck over horses is not to be denied by the material man, the brewer, the delivery trades, but to a contractor, live stock is live stock and machinery is scrap.

There is always a good market for a horse. This is one great advantage the horse has over the motor truck. Another is the availability of the horse in many situations where a motor is impracticable. Therefore the contractor must rely to a large extent on horses, and the two methods of power are not adaptable to good team work, as we might call it. Another argument advanced against horses that isn't weighty with contractors is that their use is regulated by weather conditions, and a motor truck is not. If the weather were such that the work were shut down, the motor truck would be idle also, and if it were possible to turn the truck into hauling material, the same is done with horses.

Understand me, I do not contend that the motor truck is not superior to horses for purely delivery purposes, but transportation of material is not the controlling factor in contracting; it is only in a comparatively small percentage of jobs that it is even a considerable factor. The main thing is the disposal and placement of excavated materials; of concrete and the various fabrications that enter into the completed structure. Here in New York in the city tunnel and subway work there are some notable instances of the successful use of motor trucks in hauling away tunnel muck, but it must be remembered that the conditions were ideal for the use of trucks—smooth pavements, and in the most successful instances, dumps which were used solely by the motor trucks which permitted of special dumping machinery. In the downtown districts, where the only available dumps are public, they are impracticable for motors because of the long time lost waiting in line with horse drawn vehicles.

* * *

You may have gathered that I am unalterably opposed to motor trucks, but on the contrary, I am a firm believer in them, used as adjuncts in the contracting field may be ascribed to the methods adopted or the methods omitted by the salesmen and manufacturer in dealing with contractors.

I am firmly of the opinion that there is a great future for motor trucks in this field, but you are not reaching it by selling a man a machine for $5000 or $6000 and then leaving him alone to experiment with it. It's up to you to do the experimenting—the educating—not the purchaser. For every instance of which I know where a motor truck has given satisfaction, I can cite another where it has been a failure—and I am satisfied that it wasn't altogether the truck's fault.

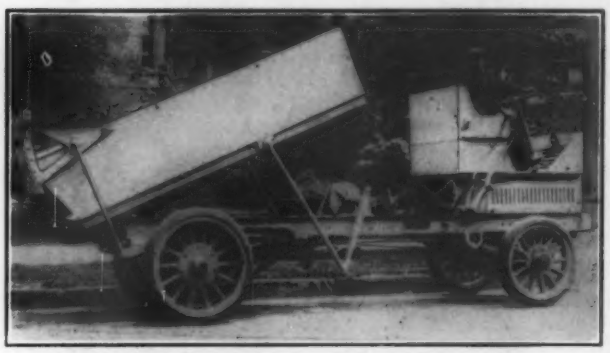
The machinery men who handle contractors, follow up a sale and find out if the machine is being properly used—if the machine is the best suited to the particular conditions—and they make it their business to see that it gives satisfaction. They maintain corps of experts who can advise on the best methods of planning a job and handling it—who can design special machinery for unusual conditions. They will install a new device, subject to approval before purchase—and the same methods are necessary on your part. The contractors' problems which can be solved by the motor truck must be worked out by you. You are the people to take the chance—not the contractor—and when the burden of proof is on your shoulders, the incentive will be there to deliver the proof.

Cost data is not convincing. As a matter of fact I am very skeptical of the cost purporting to come from contractors and published in the motor journals. If a contractor has a good thing he isn't going to let the public and his competitors know how good it is, and if he is stung he isn't going to sing about it either. Cost tables won't sell motor trucks, but a plausible idea on their feasibility for handling certain work will interest a contractor. There are a thousand and one details to be worked out. So far only one seems to have been considered—the sale. When some of the others receive your attention, the motor truck will be in a fair way to become an indispensable item in the contractor's outfit.

A NEW TYPE OF DUMP BODY, DEVELOPED BY THE ALCO ENGINEERS, WHICH DUMPS A LOAD IN FIFTEEN SECONDS

A new type of power operated dump body based on a locomotive principle has been developed by the Alco engineers. Unlike other dump body mechanisms, it has been designed for a motor truck and it is not a device formerly used on a horse drawn apparatus and redesigned or changed to meet the requirements of the motor truck.

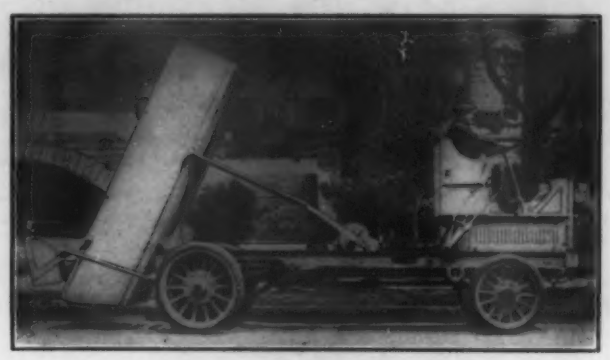
By this new device it takes less than 15 seconds for the body to be raised to its maximum height, 65 degrees. Among its other features are: a more efficient dumping angle; automatic tail gate; even distribution of load on road; automatic locking and disengaging device. The body can be raised with the truck moving or standing.



Alco Being Raised Into Dumping Position

This view of the new Alco dump-body truck shows the lifting device and how it operates. Note the lack of complicated mechanism. The body may be held at any angle up to sixty-five degrees. An automatic tailgate is another feature.

The hoisting mechanism receives its power through a jaw clutch attached to the countershaft, which is extended through the gear box. Upon engaging the jaw clutch, the power is transmitted through a worm gear and two sets of spur gears to a cross shaft which is attached to the last set of spur gears. This cross shaft is at right angles to the frame.



Alco Truck in Dumping Position

The new Alco dumping body raised to an angle of sixty-five degrees. It takes fifteen seconds for the body to reach its maximum angle

To the ends of the cross shaft is connected a bell crank fastened to a straight connecting rod, which is attached to the body as shown in the illustration. As the cross shaft revolves, the body of the truck is raised by the upward movement of the bell crank. In other words, the body follows the movements of the bell crank. One complete revolution of the cross shaft raises and lowers the body.

As the body returns to its normal position the jaw clutch is automatically disengaged and the body is locked so that it is impossible for the body to raise unless the control lever is pushed forward by the driver.

The control lever is located beside the gear shaft and hand brake levers. To engage the hoisting mechanism, the clutch is thrown out and the control lever pulled forward, the clutch being let in slowly—as in changing speeds. Pulling forward the control lever releases the lock on the body and throws in the jaw clutch.

There is provided an automatic tail gate which opens and closes as the body raises and returns to its normal position. The tail gate is so designed as to hold back a portion of the load, permitting an even distribution of the load on the road.

It is possible to stop and hold the body at any angle up to 45 degrees.

Sternberg Truck for South America

Two views of a five-ton Sternberg truck recently shipped on contract for the Government of Venezuela, South America

Paint Company's Trucks Operating on Schedule Displace the Railroad and Mail Service

JOHN LUCAS & COMPANY, the well known paint manufacturers of Philadelphia, having decided that their transportation methods were not keeping abreast of the advances in other lines of the business, decided to install motor driven trucks in a special service between their factory, which is at Gibbsboro, N. J., and the Philadelphia store, a distance of 15 miles each way. As the marketing of the goods is centered in Philadelphia, rapid transportation of the product between the factory and the Philadelphia store is very essential. Two Alco trucks were purchased for this service, each of these machines operating exactly on schedule time as though on a railroad, so that it is possible for traffic manager Frank L. Campbell to tell at any time of the day exactly where No. 1 or No. 2 truck will be.

Shipments by Railroad Too Slow

The excessive handling of the goods involving great expense and labor, and much care to keep the goods in condition, together with the fact that deliveries to Philadelphia houses were not as prompt as they should be, finally resulted in the purchase of the trucks. Goods ordered from the factory on one morning did not reach Camden until noon of the day following, and these did not reach the customer perhaps for another day. Then the traffic department "got busy," making a systematic study of the problem, and as a result, in 1912, the trucks were put in service, and have now been in daily use for a little over eight months. These trucks are only the beginning of the new "Lucas Transportation System." A Packard truck of 3 tons capacity handles the city deliveries.

Method Used for Loading Heavy Cases by John Lucas & Company
This truck, in May, carried 618,553 pounds and covered 2010 miles

In 1849, when the factory was started, every shipping point, either by boat or by railroad, was at Philadelphia; the method of transportation was to haul the goods in large covered wagons, known as Lucas prairie schooners. Each of these was drawn by four to six mules, depending on weather conditions, etc. These hauled the goods from the factory to Camden, across the river to Philadelphia, and much time was lost in ferrying, owing to the crude arrangements at that time. One round trip a day, starting at 4 a. m. was all that could be done until in 1880 the Camden & Atlantic Railroad was built, this bringing a shipping point, Kirkwood, within two miles of the factory. This shortened the horse haulage to four miles the round trip, and was a big step in advance. Increased production made it necessary to have a more direct railroad connection, which was obtained in 1887, and was satisfactory as far as points outside of Philadelphia were concerned, but Philadelphia goods were forwarded by railroad until 1906 by an express transportation company. Since 1906 the company has been doing its own hauling from Camden.

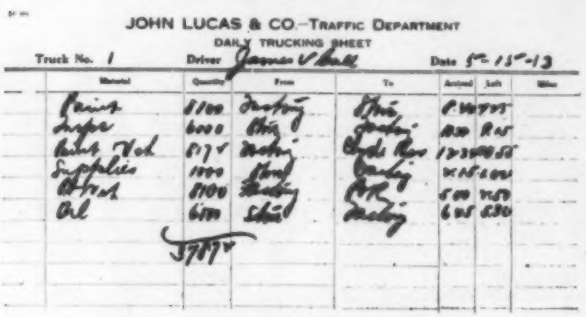
This truck service between the factory and the city store is unique in several respects. In the first place a running schedule is maintained both winter and summer, in spite of weather conditions, and in the second place, because of the systematic and accurate way in which records are kept of the costs and performance of the vehicles. At the present time each of these freighters is making three round trips per day, or a total distance of 90 miles, except on Saturday. Last month one of these trucks carried 618,553 lbs., covering 2010 miles, and the other 609,493 lbs., covering a distance of 1992 miles. The daily loads average 23,790 and 23,673 lbs., respectively.

Every load carried and every item of expense connected with the vehicles is recorded, so that the company knows to the fraction of a cent exactly what each machine has done and what it has cost. Depreciation is calculated at 20 per cent. Every item is recorded on the daily, weekly and monthly reports, even down to the cost of a lamp wick. If a new tire is needed the actual cost of the tire is recorded on that month's expenses, so that at the end of the year an average

will show, not approximately, but exactly what the operating costs have been.

The Daily Record Sheet

With this small installation of trucks, each driver is held responsible for adjustments and minor repairs, and competent men are employed. The cars are garaged at the ends of the line in small waterproof sheet iron structures. Gasoline and oil are obtained by the drivers by filling out requisition sheets. There is also a record of the oil and gasoline on the back of the driver's daily trucking sheet. A copy of



JOHN LUCAS & CO.—Traffic Department

DAILY TRUCKING SHEET

Truck No. 1 Driver James V. Ball Date 5th 15th-13

Material	Quantity	From	To	Arrived	Left	When
Paint	1100	Factory	Chris	6		
Linseed	6000	Chris	Factory			
Paint Material	5174	Factory	Chris Race			
Supplies	1000	Chris	Factory			
Varnish	1100	Factory	Chris			
Oil	600	Chris	Factory			

37872

Lucas Daily Trucking Sheet
Showing material, where taken from, destination, and time of arrival and departure

one of the daily truck record sheets for the 15th of May is here shown. This gives the time of arrival at the platform, time unloaded, time loaded and time of departure, and is filled out at each end of the line by a shipping clerk. The daily record reproduced covers the work on the 15th day of May of truck No. 1, and showed that it carried, between the factory and the store, paint, turpentine, varnish, supplies, etc., to the amount of 37,872 lbs. On the reverse side of the sheet the record shows 20 gal. of gasoline and 2½ gal. of oil for 84 miles running.

These records are kept by the traffic department on larger sheets, and in turn on the monthly automobile expense statement, a sample for the month of March being herewith reproduced. This was on Alco truck No. 1, and shows no expense for repairs; number of days in service 23; time of working, 13 hours; daily mileage, 56 2-3, with an everage daily of 22,244 lbs. The average operating cost per day for the above mentioned month is $7.67, and this includes, as shown, driver's wages, insurance, depreciation, interest on investment, taxes, license, etc. The total cost per pay for this 3½ ton truck for the month of March was $12.88.

City Deliveries

Just as complete a record is kept of the work of the city delivery trucks, a sample of a daily trucking sheet being shown. This is for the Packard No. 3, and shows that 42 stops were made in the morning, and 45 in the afternoon, or a total of 87 stops, delivering 14,000 lbs., and covering a total distance of 44 miles, on 12 gallons of gasoline and three-quarters of a gallon of lubricant. All trucks are fitted with odometers, so the mileage records are exact and not guesswork.

A 3-ton Packard made a record for the month of April of covering 1,004 miles, making 1,093 stops.

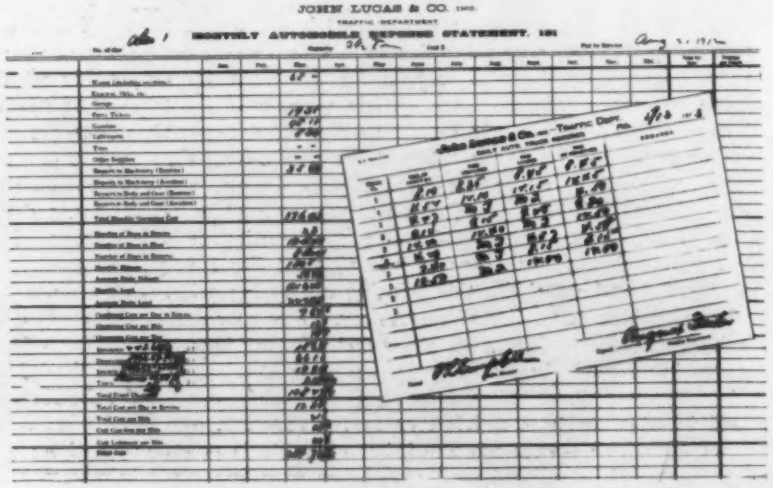
The loads are all weighed, not theoretically but actually, with the exception of the weight of drums of varnish of which the weight is known. Paint in barrels, lead, and other weighty materials constitute the loads. The machines are loaded both ways, which of course accounts for the tremendous quantity of goods handled. Since their installation all shipments by railroad have been discontinued, and even the mail is carried between the factory and store by the trucks. The freight handled by the two trucks for the 8 months which they have been in service totals 8,803,290 lbs., which shows how constantly the trucks are working.

Daily Routine

The machines start about 7 A. M. from the factory, and while being loaded the drivers under an inspector turn up the grease cups, examine the brakes and chains, steering gear, etc. The run to Philadelphia consumes on an average of one hour and ten minutes, the terminus being the store at 322 Race street. Here loading platforms and chutes are provided similar to those at the factory. Outside help is never asked to keep the trucks in commission. There is a wrecking crew provided with all the necessary equipment, and it was found that even during the severe winter weather the trucks were able to maintain their schedule, which in winter time was reduced to two regular round trips per day. Tests have been made on the various tires, and the company has finally equipped the machines with Firestones on demountable rims. There are of course as yet no total yearly cost figures, but these will be available at the end of the year, and will be exact, nothing whatever having been approximated in the records.

Bonus to Drivers

The drivers of these machines are men who have been for years in the company's employ; for instance, one was a shipping clerk, one was a horse driver, and one worked in the factory. Other men are familiar with the trucks so that they can take them out at a moment's notice. The drivers are paid $15 per week, but a bonus of $30 is given to the winning driver on December 15th, and of $20 to the driver who comes second. Ten items are taken into consideration in figuring up the winners, namely consumption of gasoline and oil per mile, tire expense, machinery repairs, body repairs, appearance of engine and body, days in service, operating cost



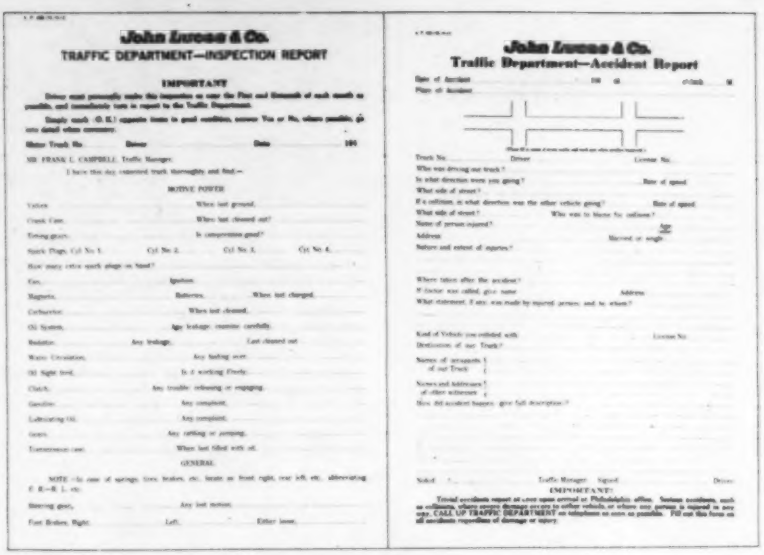
JOHN LUCAS & CO.

TRAFFIC DEPARTMENT

MONTHLY AUTOMOBILE REPAIRS STATEMENT.

Daily and Monthly Truck Records
The complete record appears on the monthly report, items being copied from daily reports

per mile, and general conduct. All these are items which are directly controllable by the driver. These items are marked every day by a committee of three, two of whom are unknown to the driver, the chairman of the committee being, of course, the traffic manager, Mr. Campbell. This system has caused a friendly rivalry among the drivers, and the cars are kept in first-class condition, and fuel and oil bills are kept at a minimum, although tremendous loads are carried. Each week a report of the standing of the drivers is handed to each driver, so that he knows exactly where he stands in the contest, so that this company is conducting a continuous efficiency contest, and the results prove the correctness of the plan.



John Lucas & Co.

TRAFFIC DEPARTMENT—INSPECTION REPORT

IMPORTANT

MR. FRANK L. CAMPBELL, Traffic Manager.

I have this day examined truck thoroughly and find:—

MOTIVE POWER

GENERAL

John Lucas & Co.

Traffic Department—Accident Report

IMPORTANT:

Lucas Forms

Note the completeness of the inspection report, also the carefully prepared accident report

Before the trucks were installed four double teams and two single teams were in use. Only one team has been kept in use and that is used around the docks and wharves where, owing to the lack of arrangements for the use of motor-driven trucks, these vehicles are kept standing waiting for slow-moving horse traffic, and therefore cannot be efficiently used. A saving of 27 cents per ton on all goods handled between the store and factory is now being effected by the trucks. Not only are the trucks saving on all the goods hauled over previous horse and railroad shipments, but the goods reach the Philadelphia store the morning of the same day ordered and are delivered by truck in the city to the customer early in the afternoon, while by former methods it often took two days and sometimes three days before the goods reached the customer.

The Lucas Company believes thoroughly in motor driven vehicles, and two touring cars are kept for the use of the sales department and at the factory. These are used by the department heads and for the convenience of customers going to and from the station. The company will add trucks as fast as they are needed, and a statement is made by Mr. Campbell that no matter whether they liked the trucks or not, competition would force them to use them on account of their speed and the amount of work that can be handled in emergencies.

The truck will increase the respect of your employees and your popularity with them

A Three-Ton Kelly Truck in the Service of the Wagner Transfer and Storage Company, of Springfield, Ohio

This truck has covered more than twenty-one thousand miles, and is now running better than ever

Motor Trucks and the Dock Question

Paper read by J. M. Van Harlingen at May meeting of the Motor Truck Club

FOR a long time the Railway and Steamship Companies, as well as the Department of Docks of the City of New York, have had various plans under discussion covering the entire reconstruction of this water front. These plans cover recommendations which directly affect the form and arrangement of the terminals and docks. The effect of these proposed improvements in terminal facilities if carried out seems likely to be so widespread as to be almost incalculable.

The general trend of these plans is along lines of segregation and mobilization of freight rather than toward the relieving of street congestion. The exception to this is in the plans which have been proposed and which will in all probability be put into effect in the near future by the New York Central Railroad, which include the elimination of its surface tracks from West Street and to the north as far as Thirty-third Street, by substituting elevated and subway structures for their present system.

The Piers of Today

The majority of the piers at the present time are one-story structures and provide a single entrance for incoming and outgoing traffic, so that the number of vehicles which it is possible to handle in the space is extremely limited. In order to appreciate the present methods of handling freight to and from these terminals we should commence on the inside of these piers and follow the freight from the time it reaches the pier in ships, lighters or cars until it is finally taken away from the water front by trucks. From the steamships, lighters and freight cars unloading and loading is invariably accomplished by power winches either on board the ships themselves or on the dock. This is by far the cheapest part of the cost of handling freight between the Steamship and the Warehouse.

It is estimated that where this handling from the hold of the vessel to the pier costs but 2 cents per ton. The cost of subsequent handling and assorting on the dock ranges between 25 cents and 35 cents per ton.

On the majority of the piers assorting and checking of freight is done in very much the same way that it has been for the past twenty-five years, with the result that teams are kept waiting for an inordinate length of time, and their full efficiency is rarely realized.

In the study of Terminal Delays made by David Beecroft, editor of the "Motor Age," the statement is made that losses of time in terminals are due to four causes, as follows:

The Cause of Lost Time

First. Loss of time because of congestion in the streets leading to the depot and from it, this congestion sometimes being due to lack of adequate police control; at other times because of the narrow street; and, again, caused voluntarily by the drivers.

Second. Delay due to trucks waiting in line to reach the unloading or loading platforms at the freight depots, caused generally by long waits for bills of lading, not sufficient unloading platforms and doors for the freight houses.

Third. Loss of time in unloading; due to one man often having to do the unloading of a 5-ton load; also due to not having enough hand trucks inside the freight depots, due further to a deplorable lack of internal systems within the freight sheds; and also due to a lack of clerical force of the freight house to properly care for the various shipping documents and bills of lading, it being not uncommon to see lines of teamsters waiting for one hour to get these documents at the dock terminals in New York City, and which is almost as bad in Chicago.

Fourth and last. The driver. He is the human factor in the case; often he is the czar of the situation, and generally he is the greatest waster of time in the entire freight system of a city.

Mr. Beecroft also says that J. F. Baron, Freight Agent of the Illinois Central Railroad, suggests that if motor trucks were used exclusively at six of the big railway terminals of Chicago that the work could be done in one-half the time at present required and at one-third of the cost, and that this would mean a saving in Chicago transportation at these six depots of $4,302,000 per year.

The general impression prevails even among those truckmen who are most opposed to the adoption of motor trucks under the present conditions, that there is an immense potential saving behind the use of motor trucks when used under proper conditions.

Most of us are familiar with saving which may be accomplished by using motor trucks under favorable conditions, and it may be quite readily understood why the motor truck has not been more generally accepted by truckmen who are doing business on the water front when one considers that trucks are frequently kept waiting from three to four hours per day every working day in the year at a loss of from $200 to $480 per vehicle per year.

Of course it is a well-recognized fact that a horse requires a certain amount of rest during each day and a certain amount of waiting time is allowable in the case of the horse to enable him to accomplish his work without any undue fatigue. We all know that this is not the case with the motor truck.

Economy of Space

One of the greatest advantages of the motor truck in congested terminals is the saving which it may accomplish in space. A single horse delivery wagon is about 18 ft. long and covers about 90 sq. ft., while a small motor truck of similar capacity occupies scarcely more than 10½ ft. in length or 60 sq. ft.; a saving of at least 25 per cent. when an extra space for maneuvering is allowed.

The average cost for pier rental on the West Side, I am informed is 80 cents per sq. ft. per year. The annual saving which would therefore be attributed to a motor truck in this one respect would be about $16.00 per year, since about the same difference exists between a two-horse team and the larger type of motor truck as was noted in the case of the small vehicle. Assuming that 40,000 vehicles are constantly engaged in trucking to piers on the West Side, and that only half the teams were replaced, this saving to pier owners in the increased space allowable for storage would be worth in the neighborhood of $300,000 per year, which in itself is no small item.

Under the present conditions the economic use of motor trucks for terminal work is problematical at best. The gasoline truck for a long time has been barred from many of the piers, but has at last obtained access to almost all of them, and it seems likely that the feeling toward motor trucks in general would be extremely favorable if it were possible to reduce the time of delays. The condition which exists at the present time at some of the piers where it is stated that steam lighters are given preference over the tow barges which would seem to indicate a partial realization of the effect of tying up expensive equipment. The reason given for favoring the steam lighter is the additional excuse which the waiting time of these more modern transfer agents involves. If this attitude were taken by the pier officials toward its motor truck, and the opportunity given to motor trucks to unload and load more rapidly than the horse-drawn vehicles, the economy effected would be considerable and the number of motor trucks in use along the water fronts would be enormously increased.

A Chance in the Future

With the adoption of more modern terminals and more systematic handling of freight in the terminals and on the docks, the time is not far distant when the motor truck will be given a fair chance to demonstrate its superiority over the horse-drawn vehicle.

A large number of mechanical devices are in use in various ports in Europe, where the conditions are extremely favorable to mechanical handling. The docks or piers are for the most part owned and operated by the municipal authorities and the facilities which are rendered at these docks are very much more complete in the larger aspects than in the majority of the private docks in New York City. The Continental piers are invariably of substantial stone construction and the steamers frequently lie broadside along the water fronts which are often lined with railroad tracks so that the goods may be shipped or transferred directly from steamers into the cars by means of overhead cranes or hoists. This is further facilitated by the fact that many of the European freight cars are of the open platform type and are much smaller than the cars in use in this country. Many of these foreign piers are equipped with a large number of locomotive cranes which run the entire length of the dock and which are operated electrically. These large mechanical devices, however, are the only point in which the foreign docks are equipped more systematically than our own. There are only a few devices in use in Europe at the present time for moving freight over the surface of the piers after the cranes have deposited it, and the movement of freight on the docks being accomplished almost entirely by horse-drawn trucks or hand trucks.

Freight-Handling Devices

In this country the number of freight-handling devices in use on the piers has increased very rapidly within the past two or three years, but the majority of these devices are only adaptable to large quantities. The more popular of these devices are the gravity chutes, escalators, moving platforms and the "telpherage" system, by which large quantities of freight may be carried from one part of the pier to another by a system of overhead tracks.

In a few of the larger docks which are operated by private dock and warehouse companies, the small electric truck has been installed to take the place of the old hand truck. These trucks have a capacity of about 2000 lbs. They have an extremely short wheel base and may be turned very readily in their own length. By this means the rapid transfer of material is secured and a large reduction is obtained in the number of men necessary to handle a given amount of freight.

On Pier No. 6 in Jersey City, the Erie Railroad is using a fleet of these storage battery trucks and twenty of these trucks has reduced the number of men required to handle freight in this depot from eighty to about thirty-five men.

It would seem that this method involves less expense and is more adaptable to varying conditions than any other which has been used up to the present time. The installation of such an equipment even on the old docks and terminals would undoubtedly result in the relief of much of the internal congestion which exists at the present time.

With the present conditions of transportation there is no object presented to the drivers for increasing the efficiency of the horse-drawn vehicle, but it has been noticed that wherever the motor truck and horses are working side by side, the driver of the motor truck is invariably more alert and more anxious to reduce unnecessary delays to a minimum than the driver of a horse-drawn vehicle, so that with the adoption of more rapid methods of handling freight within the terminals and the offering of the proposed improved loading and unloading facilities in the new terminals, a wider scope will be given to the motor truck and the increase in the number of motor trucks will undoubtedly have its effect upon the drivers themselves in securing their co-operation to the end that the unavoidable delays may be reduced to the lowest possible figure.

The Proposed New Docks

Practically all of the proposed improvements along the water front include two, three or four-story docks or terminals and it would seem quite probable that unless provision is made for handling vehicles on each floor, that these plans will tend to add to street congestion rather than to its relief.

The best formulated plans for West Side improvements are those of the New York Central Railroad. These plans are in accord with the best engineering ideas which obtain on this subject. They propose to provide warehouses and terminals between Thirtieth and Thirty-third Streets; a terminal at St. John's Park for service in lower Manhattan and terminals in conjunction with the 1200 ft. piers recently allowed by the War Department between Forty-second and Fifty-ninth Streets. If these plans are carried out an initial equipment of six terminal warehouses will be erected between Thirtieth and Thirty-third Streets on both sides of Eleventh Avenue. These warehouses will be ten stories high and will contain two levels of tracks, six tracks entering each building on each level. Each set of three tracks will on the outside have a loading platform 40 ft. wide, and a runway 60 ft. wide between each set of tracks where loading may be done directly into the trucks from the cars.

The loading platforms will each be connected with the upper floors of the terminal by numerous package elevators, and by a series of large elevators by which motor trucks or horse-drawn vehicles may be raised to the upper floors. The arrangement of the upper floors of these terminals will be similar to that of the lower floors, excepting that the space occupied by the tracks in the two lower floors will be used for storage room.

These warehouses will be arranged in pairs on each side of Eleventh Avenue; the streets are to be kept open between them. Access may be had from building to building on several floors by means of separate bridges for vehicles and foot traffic. It is stated that at the present time about 30 per cent. of platform space to trackage prevails at these West Side terminals and that this condition is responsible for a great deal of the congestion which exists at the present time. Under the proposed plan the amount of platform space will be increased to 60 per cent. and in addition, facilities for direct loading will be provided.

A Modern Terminal

At St. John's Park the proposed terminal is a single building of ten stories with streets running through the lower floor and provisions are made in this building for private platforms serving customers who may rent as warehouses a certain minimum space in the building.

In connection with the dock improvements proposed between Forty-second and Fifty-ninth Streets on the North River, the War Department has given permission for 1000-ft. docks, and it is proposed to make these three-story structures, the top story to be used for passengers while the two lower levels will be devoted entirely to handling freight. The entrances to the second story will be through each of the cross streets from Forty-third to Fifty-eighth Streets, giving easy access over the water front tracks of the New York Central by bridges leading practically at a level from the second story to these cross streets.

The lower level of these piers may be approached from Forty-second Street or Fifty-ninth Street by a private street running parallel to and on a level with the railroad tracks. This proposed arrangement should greatly simplify the handling of freight by motor trucks, and will, to a very large extent, eliminate the present congestion which exists at the loading platforms of the old terminals.

Once provision is made for the accommodation of motor vehicles it seems extremely likely that a large number of these trucks will be purchased for this class of work, and that the necessity for rapid loading, unloading and handling of these vehicles will undoubtedly be met. With the horse-drawn equipment or even with a mixed equipment of horses and motor trucks, the delay necessitated by the congestion of the docks seems at the present time so insurmountable that the question of rapid loading and unloading does not impress itself as being of paramount importance. With the introduction of new terminals and the increasing necessity for rapid distribution of merchandise, I think it is almost certain that many of the devices which are now used only in a few cases, will be taken advantage of very widely, and will form a necessary part of the equipment of every freight terminal.

A study which has been made of the loading and unloading devices in use at terminals and docks in this country and abroad by Mr. Staniford, Chief Engineer of the Department of Docks and

Ferries, of this city, shows that an enormous number of devices are available for moving every conceivable kind of freight and commodity. I feel after talking with Mr. Staniford and with engineers of the New York Central Railroad that a condition which has seemed to most of us insurmountable in the past will soon be abolished and forgotten in the development of this new and wide field for a motor truck.

In connection with Mr. Van Harlingen's paper a chart was exhibited, showing in concise form elaborate studies which have been made by experts into the relative costs of idle time in motor and horse trucks. This chart is herewith reproduced.

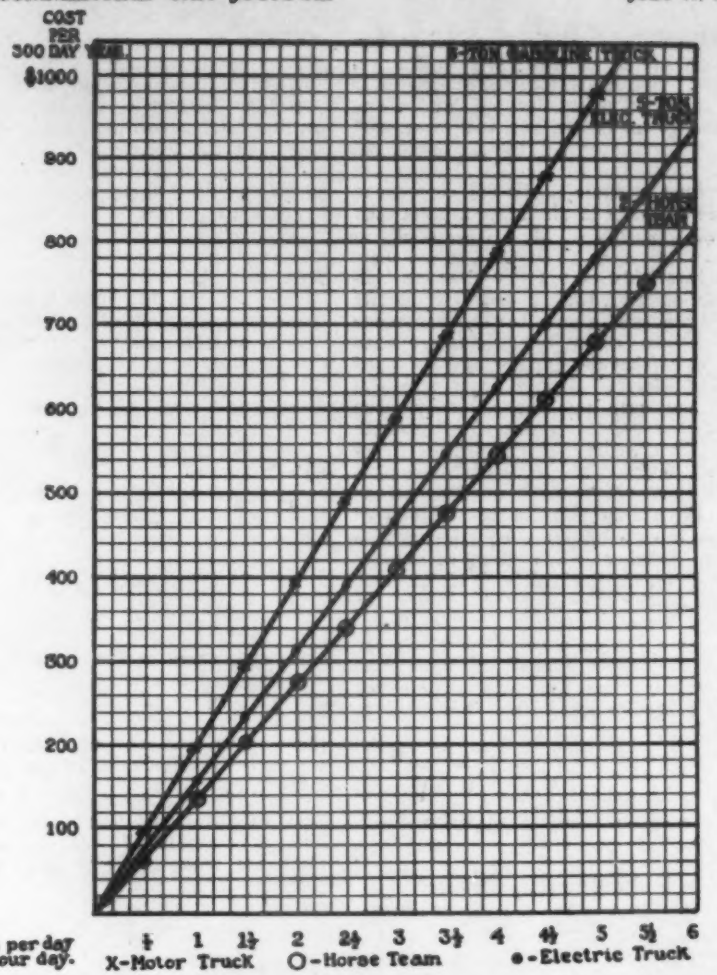
Engineers' Views of Loading

In the discussion which followed Mr. Van Harlingen's paper, Arthur J. Slade quoted at length, with interesting comments, a discussion of the same subject which tool place at a meeting of the S. A. E. held at Dayton, O., in June, 1911.

"The suggestion was made that the transportation lines might furnish at their terminals modern methods of loading and unloading trucks and also might set aside certain sections of their loading platforms for the exclusive use of motor trucks. In that way motor vehicles could be placed for loading and unloading more rapidly than waiting in line with the horse-drawn vehicles, and consequently the trucks would be kept in motion a larger proportion of the time, thereby reducing the freight distribution cost at terminals, which under present conditions is excessive.

"One of the members of the society discussed the matter at some length and referred to one location where a concern operating more than 100 horse trucks found that two-thirds of the equipment was practically idle 80 per cent. of the day, due to the fact that the trucks had to take their place in line and wait for their opportunity to load and unload. The operating expense of the installation was $136,000 annually and could have been reduced to $113,000 by the use of motor trucks in a portion of this service.

"This speaker also referred to a trip made from New York to San Francisco, visiting all the principal intervening cities, with the purpose of investigating the railroad terminal facilities and endeavoring to find out if anything could be done whereby motor trucks could get some preference in the matter of loading and unloading at those terminals. It was found out in almost every case that the railroad officials considered it impossible and argued that the Interstate Commerce Commission would be invoked if any preference was shown to motor trucks over horse trucks. The recommendation that a separate platform be provided for the exclusive use of motor trucks did not meet with the approval of the railroad officials. It was stated that the scheme was tried for a short time in Minneapolis, but was abandoned for reasons not stated.



The Cost of Motor Truck Idleness

This chart is intended to show the relative cost of idle time with a two-horse team and two types of five-ton motor trucks. (Cost of loading and unloading included.) In the case of the gasoline truck, thirty miles per day were assumed with the engine running 25 per cent. of the standing time. The value of the chart is to demonstrate the general relationship of the idle-time item between the three types of vehicles.

"A representative of the Pennsylvania Railroad Company, a member of the society, in commenting on the foregoing suggestions made the point that at a terminal like New York, where freight is brought in from all points of the United States, it would be impossible to classify the freight which would be taken from the terminal by motor truck and that taken by horse wagons. The method of distributing the freight described by this speaker was by classifying the freight alphabetically in the first letter of the name of the consignee so that when 'A' called for freight he would find it in the place designated by the letter 'A.' It was stated that it would be practically impossible to allow motor trucks precedence over horse-drawn vehicles because the man who called for 'A' freight first, whether he used a motor truck or a horse truck, would be entitled to get it first.

"This speaker argued in favor of a delivery company licensed by the railroad company to handle all the freight delivered from the terminal to the consignee's door, stating that this was the general practice in England and also to some extent in one or two American cities. It was stated that where this system was in effect a given space allotted to a freight terminal could handle five or six times as much freight as it could where individual concerns sent their own truckmen for their freight. This economy was effected by the delivery company classifying all freight as it was unloaded from the cars.

"An English member of the society in attendance at that meeting stated in his remarks that the custom in England was for the railway company, in many instances, to collect freight from the consignor at his premises and deliver it to the consignee at his premises. On the occasion of my visit to England, in the autumn of 1911, I found that this was generally the case, and in talking with one of the leading officials of a prominent English railway company learned that the system appeared to be entirely satisfactory, both to the shipper and the transportation company.

"The general impression seemed to prevail after the discussion at this S. A. E. meeting was concluded that a company licensed by the railway transportation company to collect and distribute freight at both ends of the line would prove to be the most efficient and economical solution of the problem."

Electric Light Companies Pioneer Users of Commercial Cars

(*Continued from Page 20*)

Rear View of Lamp Wagon
Used by United Electric Light & Power Company, of New York, showing the lamp racks mounted on castors, the shelves being removable.

Meter Wagons

The delivery of the delicate mechanism meter to the people of a city of the size of New York, a large part of which is cobblestone-paved has always been a problem. These little instruments cannot be jolted about with impunity, or they will register incorrectly, and as they are just as likely to register slow as fast it is to the interest of the company as well as to the user that they be handled carefully.

Chance of injury to the meters has largely been eliminated between the time of their leaving the laboratory in perfect condition and their arrival at the place of installation, by the use of new meter wagons, which very much resemble a baker's pie wagon, and in fact were suggested by this vehicle. Formerly a number of meters were placed in large boxes, and these piled upon a mat on the floor of the wagon. The heavy weight was usually too much for the mat, so that its resiliency was practically nil, and the meters were often affected by the jolting.

The new vehicles are, of course, electrics. They have a capacity of 3000 lbs. each. Racks run lengthwise on each side of the body, with an alleyway from front to back in the middle. These compartments are of various sizes to accommodate the different kinds of meters, each wagon having a capacity of forty-two. In each compartment is a mat which covers the floor and part of the wheels, and protrudes from the shelf, so that each meter is effectively cushioned against shock.

District Meter Houses Abolished

Before the introduction of the meter wagons, each of the distributing districts into which the city is divided, had a meter house, where the meters were kept for distribution in that district. When the meter wagons were installed these branch storehouses were abolished and deliveries made direct from the main storehouse, 117 West Thirty-ninth Street. The wagons are loaded late in the afternoon and start out the following morning delivering ahead of the wiring crew directly to the different jobs, thus doing away with tedious delays and waits on the part of the customer.

Electric Tower Wagon
Used by the Installation Department of the United Electric Light & Power Company, New York City. As usual, the tower is of telescopic type, but the rear closed-in compartment with steps, is a special arrangement used by this company.

The meters leave the storehouse in perfect condition, are inspected three days after being set up, and undergo a thorough and complete inspection at the end of the month. Since the electric automobile meter wagons have been installed, marked improvement has been shown in the meters at the time of the monthly test.

A Few of the Lamp Wagons of the New York Edison Company

Philadelphia Electric Company a Large User of Trucks

System and Cards Used in Keeping Records

The Philadelphia Electric Company is one of the large users of not only electric trucks, but gasoline machines, this company is now operating forty-three electric vehicles, and forty-six gas cars, ten of these gasoline machines being 1500-lb. trucks for emergency long-distance work, and fifteen are Ford cars used by the "trouble men." These little cars are fitted with a box at the back for carrying. The first runabout was put in service in 1903, for one of the engineers. In 1904 fourteen Columbia electrics were purchased and also five runabouts for the night patrolmen, whose duty it is to patrol

Ford Repair Wagon
These little cars are proving very successful in repair work of the Philadelphia Electric Company

their districts seeing that all arc lights are kept going, and cars have been added as needed ever since.

There are now twenty-one machines for department heads as follows; twelve runabouts and nine touring cars. The company also owns thirty-three motorcycles which are used by the light inspectors and trouble men. Although this large number of automobiles and commercial cars is used, a few horses are still employed for dump wagons, hauling coal, for construction gangs, and for operating a few arc lamp trimmers' two-wheeled carts. There are fifty of these latter vehicles in use pending the erection of a new garage, and while this garage is still in process of construction, a few more horses had to be purchased; but the company is gradually but surely displacing all of its horses, and the statement is made that all of its work can be done by motors.

Some very novel vehicles are employed by this company. Photographs of these machines are herewith reproduced. One of these is a pole truck of six tons capacity, which will easily carry a ninety foot pole.

The tower wagons are also of novel construction, both these machines and the special pole truck being the product of the Commercial Truck Company of America, of Philadelphia. There are also twelve 1000 lb. capacity small electric trucks, manufactured by the same company, fitted with worm drives. Some of these have now been in service five years. This installation has proved conclusively that the worm drive, when properly constructed, is a durable and efficient final drive. The report on these machines shows that they have given entire satisfaction.

The C. T. Pole Truck

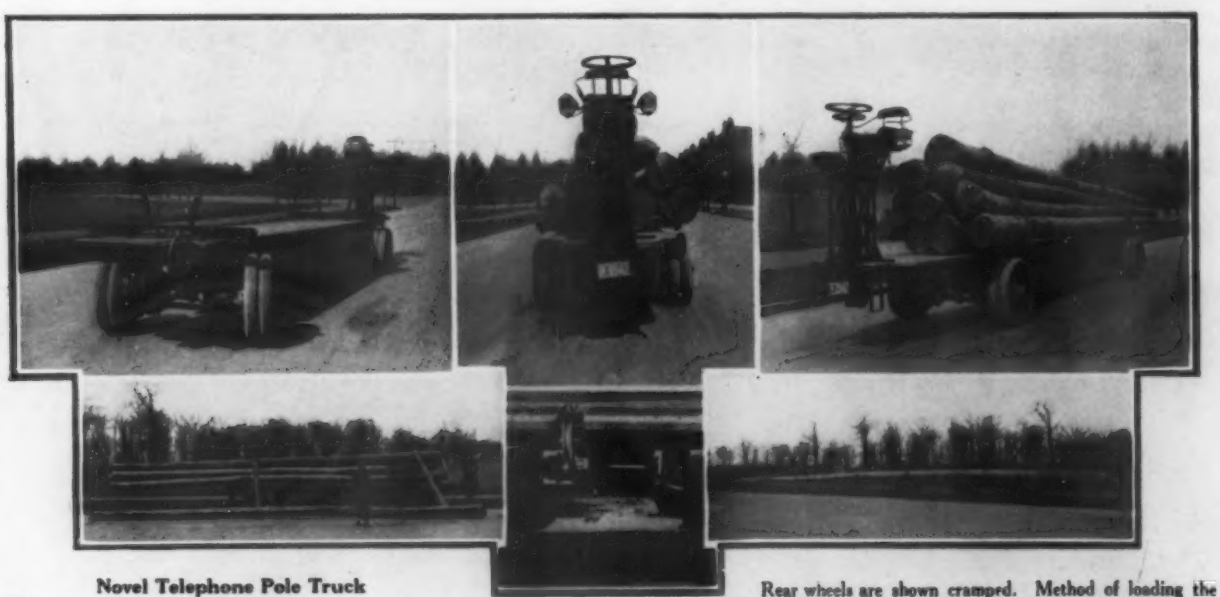
This novel vehicle, as shown in the accompanying photographs, is practically an elongated electric truck. The rear wheels have independent steer to facilitate handling in congested districts, so arranged that they can be locked when in neutral position. Loading and unloading is accomplished by an electric winch located in the center of the truck. C. T. four motor, four wheel drive provides proper traction for the 20 ft. wheelbase and enables the truck to negotiate hills, slippery streets and pull out of ditches.

Weight of truck unloaded is 12,000 lbs.; overall length is 31 ft. 6 in.; and the turning radius by using both front and rear steer is 18 ft.

C. T. Tower Wagon With Elevating Platform

For trimming and inspecting arc lights this wagon displaces horse-drawn vehicle, ladder and driver. The trimming can be done in two-thirds the time required by the old method, and with this vehicle a motorcycle and man, a horse, wagon and driver are displaced in the night inspecting service. The total weight is 4600 lbs.

The tower is elevated by a screw which is driven by one of the C. T. standard motors through a friction coupling. The thrust bearing on the screw shaft is at the top of the stationary tower so that the screw is under tension, thus eliminating any tendency for it to buckle. The platform is 14 ft. above ground at low position and 20 ft. at top of travel.



Novel Telephone Pole Truck
This electric was especially built for this service. It has a four-wheel drive and steer

Rear wheels are shown cramped. Method of loading the logs is by the small winch shown in detail. One view shows truck carrying ninety-foot pole. Capacity six tons.

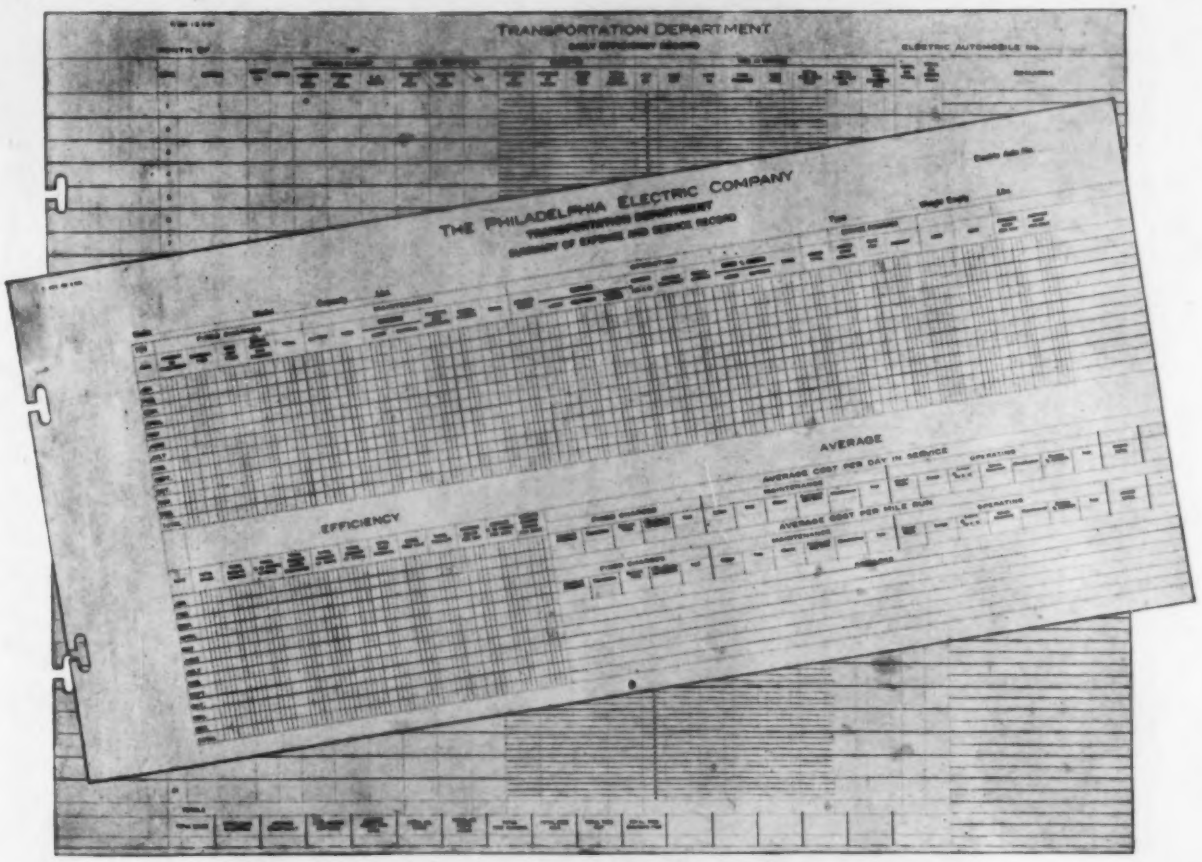
The control for this motor is operated from the platform in service or from the ground when necessary, and as the tower approaches its limit of travel either up or down, the current is automatically shut off. In addition, there is a positive stop for the tower at its up or down position to prevent its over running, the friction coupling on motor preventing the momentum of the armature carrying the tower beyond these limits.

The control for operating the vehicle and the brake can be operated from either the lower or upper seat as in the other types.

the vehicles while in service, and has nothing whatever to do with their garaging or stabling. All requests for vehicles or hiring for any kind of work must go through his hands.

A dispatcher keeps a record of the time the company's vehicles leave and return to the garage, showing the driver's name and his first stop. This is filed in the chief's office.

The vehicles are divided into two classes, "assigned," or those required for continuous service, and "unassigned," or those used in intermittent work. The latter can be secured for service only by filling out an order card, which must be signed by some one in authority. The passenger vehicles are



Daily Efficiency and Expense Records Used by the Philadelphia Electric Company

Transportation Department

The company's system of caring for the vehicles is also slightly different from the usual method. A department known as the transportation department, was organized with the idea of increasing the efficiency of the system by decreasing the cost of hauling. The first step was the placing of the control of all vehicles under one head, instead of under individual departments, as formerly. This division now controls and supervises the movements of all horse-driven, as well as power-driven, vehicles, either owned or hired by the company. The chief, whose office is located at the main garage, 1208 North 31st Street, is directly under the supervision of the superintendent. He has a representative on duty from 5 A. M. until 11 P. M., who can be reached at any time by telephone. The chief handles the automobile drivers through a dispatcher, who comes under the garage foreman, and the horse wagon drivers through the stable foreman. He controls all assigned, except when used as emergency cars to take the places of ones which are being overhauled. Nearly all the electric trucks are assigned to use by the installation bureau, aerial line, or underground departments, and carry gangs of men, poles and materials to various jobs on the street. An attempt is made to keep the same vehicle with the same forman as much as possible.

Transportation Department Run as Separate Concern

Each driver is provided with a delivery slip showing the nature of the work to be done, giving necessary directions, and stating to what it is to be charged. This latter is an important item, as the transportation department is considered as an outside concern and all records, cost of operation and maintenance, etc., are kept on this basis, a balance being drawn at the end of the year which shows whether there is a gain or loss. The exact cost of each truck is charged against it on special forms for this purpose. If outside hauling is done a

"carter's time tag" is made out in triplicate, one going to the teamster, one to the transportation department, and one to the auditing department.

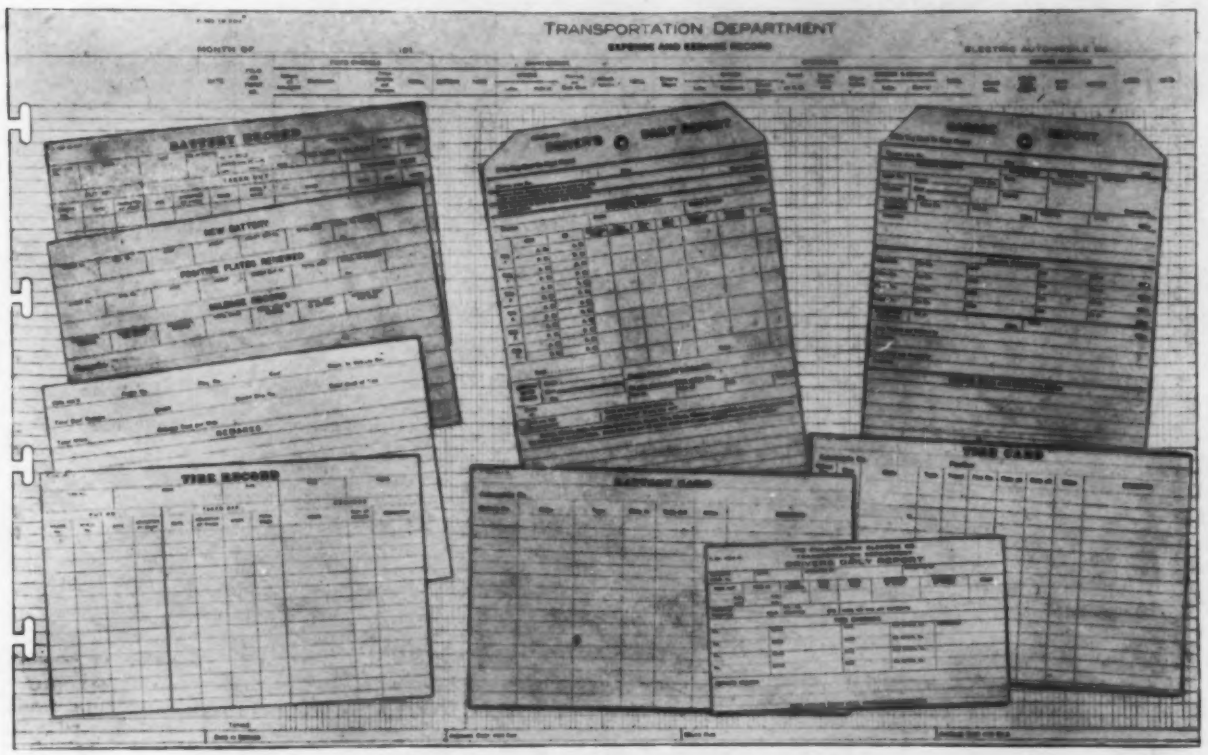
The delivery slips which show the nature of the work and to what it is to be charged are placed in a rack each night under their proper number, and after these have been properly filled out by the driver and turned into the office as "completed," or "not completed," as the case may be, distribution time reports are made out from them, and copies sent to the superintendent's office, accounting department, and for hired vehicles, to the man who has charge of these. The system is very complete, and every item of expense is recorded. Some of the important forms are shown in the accompanying page illustration and the uses of each are briefly summarized as follows:

Hired vehicles are charged at the rate actually charged by the transportation department, while company vehicles are charged for at a fixed rate which is just as near as possible to what they actually cost the company for upkeep, as it is possible to make it. This fixed rate includes fixed charges, such as office salaries and expenses, including inspectors' salaries, all "maintenance costs," such as tires, repairs, batteries, feed, bedding, shoeing, repairs to harness, and replacing horses, and under the cost of motor driven vehicles "operation," such as driver's wages, garage and stable, gasoline, oil and accident expenses.

The garage, repair shop and stable are under the charge of competent foremen who care for these departments, and report directly to the superintendent. The hired teams are used for extra or miscellaneous jobs when it is deemed advisable.

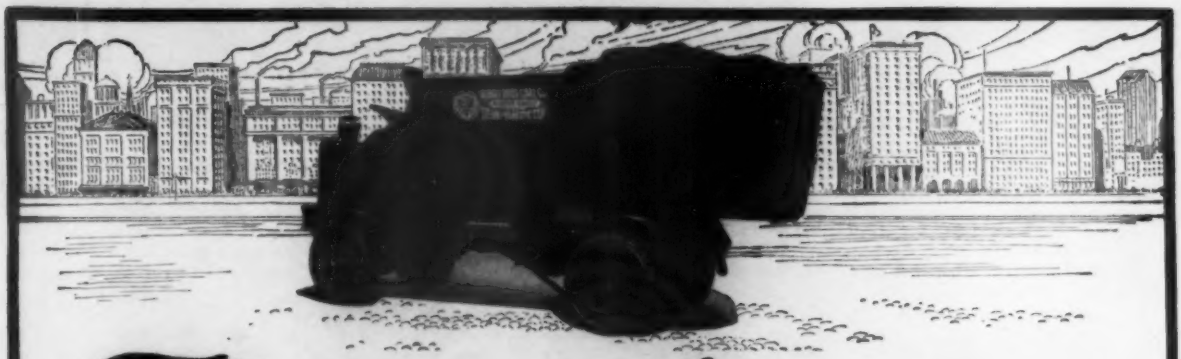
From the photographs which accompany this article, it will be noticed that a number of the companies are hauling poles on trailers. The Ideal Auto Company states that its trucks are designed with engine, frame and jack shaft larger than will be required for ordinary service, so that the trucks may be used with trailers. An Ideal truck of two tons capacity is shown loaded with 2½ tons of cross arms, wires, etc., and in addition hauling five tons of telegraph poles on a trailer. This load was hauled 16 miles in an hour and three-quarters, which is as fast as the trailer would stand, it being possible for the truck to have gone faster if the trailer could have withstood the strain. Six to eight miles an hour has been found to be as fast as is practical with trailers of this character. Three to four trips a day are possible with the truck in hauling poles, where a team would make but one, and as the truck and trailer will haul as much as two teams, such a combination will do the work of six teams and six men. A team of horses has been found of great assistance in hauling the logs from the woods to the road, so that the trailer could be loaded before the truck got there. Thus it is only necessary to load the truck when it returns with the empty trailer.

The West Chester Lighting Company, of Mount Vernon, N. Y., is using a three-ton Garford. This truck has been in service over a year. The statement is made by this company that it has never been laid up a day for repairs, and has covered more than 10,000 miles during that time in their severe service.



Forms Used by Philadelphia Electric Company

Daily driver's report and garage tag and other forms which are used in keeping accurate truck costs



Firestone

Notched Tread Continuous Base TRUCK TIRES

Let us show you records made by these tires in heavy service which put them in a class by themselves for mileage. Not an occasional "lucky" showing—but the average results obtained throughout the list of hundreds of users.

And when you understand the tire you will understand the records.

FIRESTONE RUBBER—toughness without hardness—most "cushion" with greatest wear resistance. Mileage—with most protection to Truck.

NO BULGE IN FRONT OF LOAD. Notched tread takes up traction wave. Therefore, no tread separation, no tearing away from the rim.

CONTINUOUS RUBBER BASE. No separate blocks to wear unevenly or tear out.

BETTER TRACTION. Notched tread grips pavement or road, no wheel spinning—gasoline saved. Also skids prevented.

These and other types of Firestone Tires, on Firestone Quick Removable Rims, are raising the standards of Truck efficiency and are reducing operating costs for business houses everywhere. Why not for you?

There are Firestone men near, at your service. Look in the telephone book.

THE FIRESTONE TIRE & RUBBER CO.

"America's Largest Exclusive Tire and Rim Makers"

Akron, Ohio Service Stations Everywhere

This tire for heavy service—Single and Dual Tread

Write for Catalog Showing Many Styles for all Classes of Service

One of Those "Why Wasn't It Thought of Before" Things

When Writing, Please Say—"Saw Your Ad. in the C C J"

Interchangeability of Parts

By CHARLES BALOUGH, Chief Engineer, The Kelly-Springfield Motor Truck Company, Springfield, Ohio

INTERCHANGEABLE parts rather than standardization of motor trucks is the answer to the question now confronting the United States Government. This solution will not only benefit the government, but will work to the advantage of all big business concerns using large fleets of trucks.

The United States recently asked for the opinions of the leaders of the leading motor truck engineers on the practicability of standardizing a truck for the use of the Army.

After considerable thought I believe that the time is not right to attempt the standardization of trucks. The time is ripe, however, for the leading truck manufacturers of this country to get together and agree upon a definite working plan which would help the Government and themselves.

The leading motor trucks are designed upon sound conventional principles along the lines of conventional type mechanism.

If the amount of business to be secured would warrant it, we believe that a considerable number of the leading manufacturers could get together and change a few main dimensions on their machines so that the units of different machines could be interchanged.

The main points to be decided are:

1. Uniform width of frame.
2. Uniform length of wheel base.
3. Uniform loading space back of driver's seat.
4. Uniform size of wheels and tire equipment.
5. Uniform sprocket centers.

The simplicity of these changes can readily be seen when it is considered that the last three items are optional in the equipment of most manufacturers.

A glance at the detailed workings of the plan also shows its extreme simplicity.

The hub bearings on certain trucks are practically interchangeable today. It would be a simple matter to standardize the width and length of springs. This would make both axles interchangeable in units without any further changes, as the threads are now standard.

The jackshaft and transmission units need to be interchangeable only as to their seats in the frame angle. This could be done easily after the width of the frames has been made standard. To do this, of course, would make it necessary to consider the drive shaft and universal joints units with the transmission and jackshaft.

It would be necessary to standardize the cone clutches only as to diameter and width of face, and as to the length of the clutch between the fly-wheel and the front end of the drive shaft, or transmitting unit. This would also mean the standardization of the bore of the fly-wheel for the clutch seat.

Practically all the carburetors, magnetos and wiring, and gasoline connections can be standardized with little trouble, as the majority of manufacturers are now using standardized articles for these purposes. The only details remaining to be worked out in this connection would be the sizes of the union connections. The length of pipes are very much alike, and other things would make little difference, as connections could be bent or coiled up in case of emergency.

It would not be necessary to make such things as foot pedals, gears, brakes and clutch control parts standard, as if these were made of a good reliable grade of drop forgings there would be hardly any necessity to replace them.

The principal advantage of the plan submitted here lies in the fact that each make of motor truck could retain its individuality and independence of opinion and judgment in its design and construction. To change the point suggested would be comparatively simple, as the bulk of the tool equipment of the motor truck manufacturer would not have to be changed in any way.

The new parts that would be necessary, if this plan were put into operation, could be independently tooled up and treated as any other special equipment. These changed parts could be produced with economy if they were ordered in sufficient quantities.

I believe that a board of engineers representing the leading truck manufacturers could work this proposition out to mutual satisfaction. If the Government were willing to divide their purchases equally among the companies represented in this mutual plan, the details could be satisfactorily worked out.

Especially in the case of trucks for use of the war department would this plan be beneficial. In times of real war, or even during maneuvers, there is so much haste that it would be impossible for the soldier mechanician to make any small or delicate adjustments. It would be far simpler to interchange entire units of construction from trucks which are out of commission to other trucks with little delay.

It appears to the writer that it would be impossible to put a new gear in a transmission or a new differential in a jackshaft, or even a new piston in the motor. It would be much simpler, and could be done with little delay by the placing of entire units into the remaining trucks. This would mean only the taking out of bolts and nuts and would require little or no real mechanical skill and adjustment.

To my mind, this plan possesses all the advantages of the standardization of motor trucks without any of its disadvantages. I firmly believe that it is practical, and would effect a great saving for the Government and the motor truck manufacturer interested if it were put into operation.

U. S. GOVERNMENT MAKES OFFICIAL TEST OF TRUCKS

Motor truck makers are jubilant over the announcement made recently that the United States would officially and thoroughly test commercial motor vehicles for use in the army. It is understood that the truck will be tried out under every condition with a view to determining how much more efficient and economical it is than the horse and wagon system now in use. An investigation board has already been appointed and it will soon announce the date and conditions of the test.

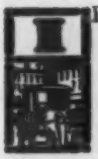
HUGO HOFFSTAEDTER, General Manager of the Polack Tyre and Rubber Company, recently read a paper before the Bridgeport Board of Trade in which he reviewed the history of the manufacture of solid rubber tires as carried on by the Polack Company. In the early stages the rubber was vulcanized directly to a steel rim while later on a hard rubber band was used as a binder. The use of a steel base revealed other substantial advantages, one of which being that by choosing a steel base sufficiently strong, it could be pressed on hydraulically to the wheel and required no other attachment to hold it in its place. The paper also describes the process of gathering rubber, the method of manufacturing it into a commercial product, and the Polack method of moulding it on to the steel band, which is done by applying layers of about ¼ in. in thickness and pressing this into a mould.

THE AMERICAN EXPRESS COMPANY recently adopted electric baggage trucks for handling express matter at the Union Station in Indianapolis. Each truck has a capacity of two tons and can pull several hand-drawn trucks. The steps at either end, when mounted by the operator, automatically release the brakes and when he steps off, the current is shut off and the brakes set.

"Keep pace with your day and generation,"---use trucks

How Not To Sell Trucks

By A SALESMAN



IF you can't boost, don't knock. That's one of the things I have had ground into me so hard within the past three months that I haven't fully recovered yet. You see, I've been properly humbled. From considering myself some pumpkins in the truck selling line, my estimation of the abilities of yours truly has been reduced to pretty near zero. I'm willing to eat out of anyone's hand who can land the big orders; willing to do almost anything but sign my name to this confession. I'll give you my experience for the benefit of the many who are probably following the same tactics that brought me to grief.

I graduated from the pleasure car field about two years ago. With a good record behind me in that line, I was promoted to the truck department of the company and I welcomed the opportunity to do business on a business basis. Selling touring cars had become complicated in the few years previous to such an extent by the second hand car and the necessity of pleasing everyone in the family before you landed the deposit check that I was strong for the commercial proposition. I figured out that the amount of energy required to sell twenty high-priced cars a year would go twice as far when applied to trucks and it would be a business with a whole lot better foundation. The first truck is only the entering wedge. Business concerns grow so fast nowadays that duplicate orders are largely a matter of making good on the first sale, and our machines made good every time.

During the first eighteen months of my commercial experience I had a good opportunity to find out that selling is selling and that no matter how good your proposition is, the other fellow has some pretty good things in his bag, too.

But during that first year with few exceptions my orders were "singles" with no immediate prospect of any velvet behind them. But I kept hot on the trail all the time and the annual accounting left no regrets. I was doing the business and doing more of it all the time; the trouble was, it was always new business, and worse than that, it wasn't big business. I was delivering the goods, but it made me jealous to see the other fellow bringing in the three and four machine reorders without half the push that I was putting into it. They didn't sell any more trucks than I did, but it seemed to me they sold them a whole lot easier; they were on easy street.

I Had Hopes

But I had hopes and I didn't take them all out in hoping either. There was a big concern on my list that was ripe for big business. They were using more than a hundred horses and the business was growing so fast that it was difficult to take care of the increase by the old methods. The president of the concern was a man over sixty and he had been responsible for developing it from nothing to a point where Bradstreet took pleasure in putting "AA1" after its name. I know that if I could get Mr. Sinclair to put the firm signature on the first order blank, I was made. He was dignity, doubt and conservatism personified.

After warming a waiting room chair for many months and taking considerable wear out of the private office carpet, I got around the first. He even got to the point where he'd call me Bill, probably because I always came around on the first of the month, as well as other days. The second and third points were not so easy. Shifting from horses to commercial cars was going to involve an investment running into six figures and the plan was to put trucks into service as fast as the horse equipment could be disposed of without sacrificing it. Orders for machines would be placed in lots of five at a time. You see, I had covered the transportation service end of the problem with them pretty thoroughly. Had spent a lot of time looking into their delivery methods and had given them some pretty good data on costs, methods of handling routes, shown them how we could break their old drivers in to handling the machines so that there wouldn't be any interruption of the service and a whole lot more information of the same kind.

I Didn't Soft-Pedal the Cost of Accidents

The information was given as coming from a man who knew the business inside out. It wasn't a case of telling them "this is how it can be done with OUR trucks." I showed Mr. Sinclair what the modern commercial car would do for his business, how it would save a substantial percentage of their present expense of handling goods and how much more reliable a service could be maintained with only a fraction of the number of vehicles and drivers than they were using. It wasn't theory and I didn't soft pedal the cost of accidents or breakdowns.

Suppose We Broke Down

"Take for example, a case where one of your machines went wrong five miles out and our driver had to telephone in for assistance," Mr. Sinclair would interrupt me in his calm, deliberate manner, sticking his finger tips together and tilting back in his chair. "What would it cost us to deliver that load?"

"Well, your emergency truck could reach there in twenty minutes from the time you got the call for help." You see I hadn't tried to get away with any "never-break-down-with-our-trucks" kind of arguments, and I had impressed upon him the importance of always having a machine in reserve to take care of a service as large as his properly. "Send your emergency truck out at once and if the two drivers can't get the machine going without delay, tow the disabled one in. If the original machine was nearer its destination than home, transfer a small part of the load to the empty to give it traction and tow to where you set out for, both then coming home empty with the breakdown in tow. That's one solution. Should the distance be great let the emergency take the load and pick up the disabled machine on its way back."

"Now tell me how often do your big three-horse trucks lose a wheel or break a rear axle?"

"Far too often for our peace of mind, that's certain.

Finally one day I got some real encouragement. "I haven't got time to see you to-day," the old man told me, "but I've been talking it over with Henderson and he's convinced that it's time we made a move. Call me up in a few days and I'll give you an appointment." Henderson was the general manager, so I knew things had reached the buying stage.

When our salesmanager handed me a letter the first thing the following Monday morning, "Please call to see our Mr. Sinclair at 3 P. M., on Monday," I could hardly wait. I had the commission on that first order of five trucks in the bank already in my mind.

I found the president, general manager and treasurer of the company waiting for me. It was a case of three to one, and the old man whom I thought I had riveted and cinched let me hand myself the double cross that's been making me feel so sore ever since.

We Intend to Decide the Motor on Merit

"We have finally decided to invest in new equipment and will put five machines in service at a time, putting them on as fast as we can get delivery and train our men." That certainly sounded mighty good, but I noticed he was intently looking over a slip that I fondly hoped were some of my facts and figures. They weren't. "The question is just what machines will give us the best service for the investment," he went on. That wasn't so reassuring. "We intend to decide the matter on the question of merit entirely and want to make our equipment all uniform, so that whatever truck we buy we will stick to. Mr. Henderson has given me a list of six representative trucks here and we're going to give each one of them a hearing before deciding. Now your machine is pretty near the top notch where price is concerned, but we want the best there is to be had, and if you can show us that your truck is a better investment than the others, you get the order."

The battle was on.

"Now, take the 'Blank,' mentioning a well-known make. There's a difference of close to $800 in their price and yours for the same type of machine. That means that your trucks will stand us about $15,000 more before we get through. How do you account for the difference?"

It was up to me to make my competitors look like the proverbial thirty cents and I went at it hot and heavy. It wasn't possible to cut that much out of the cost of building a five-ton truck without sacrificing the material; there was a lot of punk in it, the parts were too small to stand up and a lot more on the same order. The motor was under the seat and that was all wrong.

"But there are lots of those trucks in service around here."

I had to admit there were, but they were giving all kinds of trouble. They were breaking down right and left.

"How about it, Mr. Henderson?" The old man was as calm and judicial as a Supreme court judge, and the others didn't say a word unless they were spoken to.

"Jones, of the Simpson Company, tells a very different story," Henderson answered. "They've had very little trouble and they like the machine first rate.

That was a body blow, but even then I didn't see the light. I saw that order slipping away from me, and between fear and disappointment I must have lost all the common sense and diplomacy that I ever accumulated in my selling experience. I wasn't fitted to swing big business, but I was blind to my own weakness then, and I blundered along the same line of knocking that I had started on.

"Let's take them next on the list. How about the 'Blank?'" went on the old man without batting an eyelash. "The difference in price is not so great, but it will amount to a very substantial saving in the aggregate if we can use their trucks instead of yours."

I Couldn't Think of Anything But Knocks

This calm, analytical way of going at it stumped me. I couldn't think of anything but knocks. The "Blank" had a puny little gear box that would give no end of trouble in a short time. It was nothing more or less than a touring car transmission that simply wouldn't stand up at all. At least, that was the way I put it.

"I believe you have some information about this make, Mr. Ripley," and the old man got the other side of the story from the treasurer. Mr. Ripley had and it got me in deeper. "Franklin, of the Barnes Company, has been using three of their machines for almost a year now and he reports that they give very satisfactory service with loads as heavy or heavier than ours, and the maintenance charges are very reasonable," was the gist of Mr. Ripley's tale. Still I didn't wake up. Right through the list I blundered, knocking here and knifing there. If a competing truck didn't have a bum motor, it had weak and spindly axles or spavined wheels; without exception they were junk and rattle traps as compared with the one and only truck that I was selling. But every time he picked a new one on the list the old man called for a report from either his manager or treasurer, and with few exceptions they did no credit to my attitude. Our own trucks had been investigated with the same care and they had showed up well, and in one case the other side of the story substantiated my knock to a certain extent; but with the big difference in first cost, there was not much comfort to be extracted from the interview. I was in a cold sweat when the ordeal was over and a jump off the dock in December couldn't have squelched my high hopes of landing that order any more effectively. I felt clear down to my toes that I had made a mighty poor showing, but I didn't realize just why. My worst fears came true three days later when we were politely informed by letter that they had decided to buy another make and thanked us for our interest in the matter.

Our salesmanager handed me that letter as if it had poisoned nettles all over it and it hurt me more than it did him, because I knew I was to blame in some way but didn't realize just how. "Bill, you've gone and put your foot into it bad; you've queered the business some way. What have you been doing?"

The Worst Blow of All

"I put my very best efforts into the job and I fell down simply on the question of price," I answered and started to move away as if that was all there was to it. But Rankin hadn't been made salesmanager of a big concern on his good looks alone and he was bound to get at the root of the matter. "Come into the office and we'll talk it over," he said, and talk it over we did, but I was as subborn as a mule. I was plum pig-headed and I persisted in it until he go mad clear through. I wouldn't admit or deny anything but that I had used the best of my powers of salesmanship to land the business and the price consideration was too much for me, but he wouldn't have it that way. "Now, Bill, you know we're building a better machine than any concern Sinclair had on his list. You've done some mighty good work with other concerns and I know you did a lot of good work with Sinclair. You can't tell me that you lost out on price alone. You have put your foot in it some way or other and before you so much as stir out of here to see another prospect, you're going to find out what it was so you won't make the same mistake again."

"But, how am I going to do it?" I asked.

Prompt Business Requires White Trucks

POSITIVE service at all hours, in all seasons, long hauls or short, heavy loads or light deliveries—it is a White Truck that is best fulfilling these requirements, somewhere for some owner.

Where sentiment does not count, facts show that White Trucks run farthest and cost least to operate, whether per package or per ton. Your business promises will not suffer where White Trucks do your hauling and the efficiency of your service will be marked.

THE WHITE COMPANY
CLEVELAND

Manufacturers of Gasoline Motor Cars, Trucks and Taxicabs

"You're going straight to Sinclair and get it from him."

Well that was the worst blow of all. But go I did; it was that or lose my job. But take it from me, I didn't relish the task. It was with far different feeling than I had made the same trip a few days earlier, and it didn't make me feel any better when the office boy brought back my card with "Mr. Sinclair doesn't care to see you." I made the trip back as slowly as I could and took a couple of bracers on the way to what I felt would be my resignation by request. But much to my surprise Rankin didn't say a word about that part of it when I told him Sinclair wouldn't see me.

"He'll see you all right. You just sit down there a few minutes till I come back." He went to his private office and I heard him using the phone, but couldn't make out what he was saying. In a minute or so he came out. "Sinclair will see you, so go ahead over and get the story," and with that he left me to my fate again. Should I tackle the job or quit right then and there? I was tempted to do the latter but good sense got the upper hand and I've been thankful that I didn't ever since. It would have been the end of me as a salesman.

The office boy was pretty surprised to see me again in less than an hour after such a cold turndown, but he took my card in and held the door open for me when he came out. The old man shook hands as cordially as if he hadn't seen me for months and told me to sit down, but didn't say a word. He just sat there and looked at me in the way my dad used to when I was up on the stool for some sound paternal advice.

"Bill, you're a hell of a salesman," he finally said.

I agreed with him thoroughly, and as we were both entirely in accord on that point, I couldn't think of anything to say that would make it any truer, so I held my peace.

You Killed Your Own Goose

"You killed your own goose so dead that last day you were in here that you didn't have a ghost of a chance. Both Henderson and Ripley crossed your machine off the list the minute you had gone, and much as I disliked to do it, I had to agree with them. In fairness to the machine, we ought to have asked Rankin to come down and give us a talk, but they wouldn't hear of it.

"You're acquainted with Seymour of the 'Blank' Company, aren't you?"

I was and I didn't have to be told that he had taken the order away from me. I hated the sound of his name.

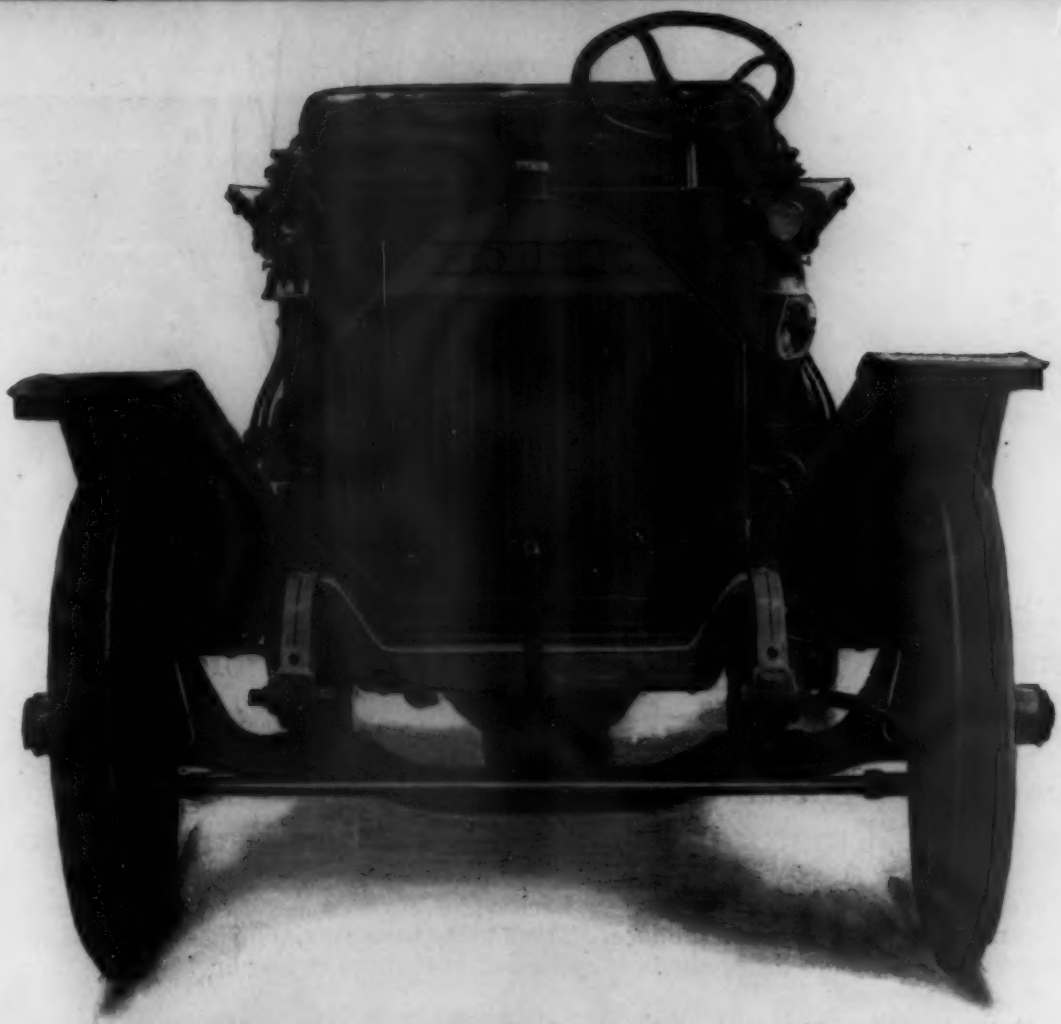
"Now, he was up against exactly the same thing as you were and he was way down on the list at that. But when we asked him how your machine compared with his, he didn't tell us that it had a dollar and forty-nine gear box in it or a 1902 model motor. He said it was a mighty good machine and he had a good word to say about the others, too, but he showed us that he was selling a better one, all things considered, and he showed it by pointing out why his machine was better suited to our business, and that it would be a better machine even at the same price as yours, though he had an advantage in the matter of price. If it will make you feel any better, I tell you some of the others were in your class, too; they knocked your machine as badly or worse than you had knocked theirs. Instead of trying to demonstrate that they had a better proposition for our business than the other fellow, they knocked him just the way you did and you wouldn't be flattered to hear the opinions of your car. If it hadn't been for Seymour, we would have wasted all that time for nothing and wouldn't have been any farther ahead than when we started. We couldn't have believed any of you and would have had to delay our decision until we could make further investigation. But he put the matter on a sound business basis; he showed us that his company was building a good machine, not 'the one and only truck that would do our work now and forever more, so help me,' as you did, but a good well-built car that would do all that we wanted of it and do it economically, and we took him at his word.

"Bill, here's one of my cards. When you get back to the office, take a pen and print on it in big letters, 'If you can't boost, don't knock.' Stick it in your hat band and just before you go in to see a man to close a big deal, take a good, long look at it."

Five-Ton Truck With Hollow Steel Wheels

Five-ton Renault truck, fitted with George Fischer electric steel road wheels with tubular spokes and hollow rims. The sole agency for these wheels in America has recently been taken by Peter A. Frasse & Company, Inc., 417-21 Canal Street, New York City.

REPUBLIC MEANS SERVICE



THE REPUBLIC TRUCK

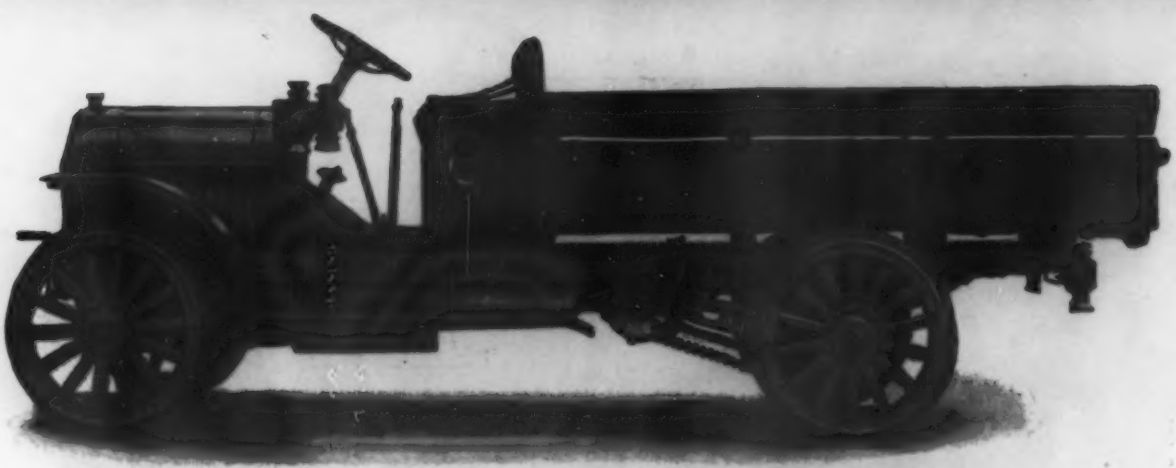
1500—2000 Pounds Capacity

Price $1425.00

(Including Stake or Express Body)

A Selling Proposition of Unusual Interest to Live Dealers

REPUBLIC MEANS SERVICE



Republic Truck Fitted with Standard Express Body

There is no truck on the market that will give as good service as the REPUBLIC, regardless of its price.

From radiator to tail-gate, from top to bottom, every part is designed and built with strength enough to take care of 50% more strain than it will ever be subjected to.

Read over the specifications opposite. Each and every part is the best that money, workmanship and brains can produce. These parts have set the highest standard the world over,—they are the products of specialists in their particular line.

How can we sell a truck with all these dependable parts, found only in the highest priced trucks, and include a stake or express body, for $1425?

The whole secret is production facilities,—quantity and quality. Every truck manufacturer, when figuring up the selling price of his product, must include in that selling price an allowance to cover the cost of defective parts. By using the better standard parts, we have but few replacements to make, enabling us to figure close.

And this gives the owner uninterrupted service

ALMA MOTOR TRUCK CO.

Factories: Alma, Mich.

REPUBLIC MEANS SERVICE

Brief Specifications:

Continental Motor—A motor noted for its strength, dependability and year-round efficiency,—one that has proven its merit in the industry.

Covert Transmission—Strong and durable. Designed especially for trucking purposes, and found only on the better class of trucks.

Gemmer Steering Gear—A steering gear which has a reputation for efficiency, second to none. Built for hard work and continuous service.

Lewis Springs—A combination of elasticity and strength; built of the highest grade spring metals procurable.

Schebler Carburetor—The heart of the truck. Schebler produces perfect carburetion under all and any conditions.

Eisemann Magneto—Pronounced the most efficient magneto for trucks. Found on the highest grade trucks in the market.

Culver-Taylor Chains—Built by chain experts who produce only truck chains. Recognized universally as the chain of 100% efficiency.

Bower Roller Bearings—The perfect bearing for trucks on account of its non-adjustable features, true alignment and accuracy of construction.

Left-Hand Drive—A feature found on all up-to-date models of trucks and pleasure cars. The correct form of drive and being adopted by all leading makers.

Center Control—Ease of operation, and working in complete accord with the left-hand drive.

ALMA MOTOR TRUCK CO.

General Sales Offices: Detroit, Mich.

REPUBLIC MEANS SERVICE

To Live Dealers:

Never in the history of the industry has such an opportunity been open to the dealer.

Think of it. A one-ton truck for $1425. And not made of untried features, but parts that are standard the world over and recognized as the best.

An opportunity such as this comes but once in a lifetime. It is for you to take advantage of quickly. Do not delay,—the time is **NOW.**

We seek connections with live, responsible business men,—those now identified with the industry, or that type of aggressive business man who can quickly grasp the business possibilities and opportunity in representing us.

Write us promptly

ALMA MOTOR TRUCK CO.

Factories: Alma, Mich.

General Sales Offices: Detroit, Mich.

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is the logical paper for every man to read who contemplates buying or selling commercial motor cars.

It is brimful of essential information.

The Commercial Car Owner will also find many suggestions in it that will make his driving more efficient. Send for a sample copy.

COMMERCIAL CAR JOURNAL

Market & 49th Sts., Philadelphia, Pa.

SHELDON AXLES

Sheldon Equipments Received Perfect Scores

In May a gruelling 4-day reliability run was conducted by the Washington Post. Not a road or technical penalty was imposed on any of the trucks which were equipped with SHELDON foundations of Springs, Axles, Brakes and Jackshafts for trouble with these parts. At the finish every washer, bolt, nut and cotter was in its original position—exactly as it left the starting line.

The wisdom of the manufacturers of the above trucks in equipping them with SHELDON foundations of Axles, Brakes, Jackshafts and Springs was proved by this reliability run, which was witnessed by representatives of the government.

SHELDON products are actual sales-helps.

SHELDON AXLE CO. Wilkes-Barre, Pa.

Chicago Office	Detroit Office	San Francisco Office
68 East 12th Street	1215 Woodward Ave.	444 Market Street

877

These Forces Will Sell Kelly Trucks for You

YOUR SALES

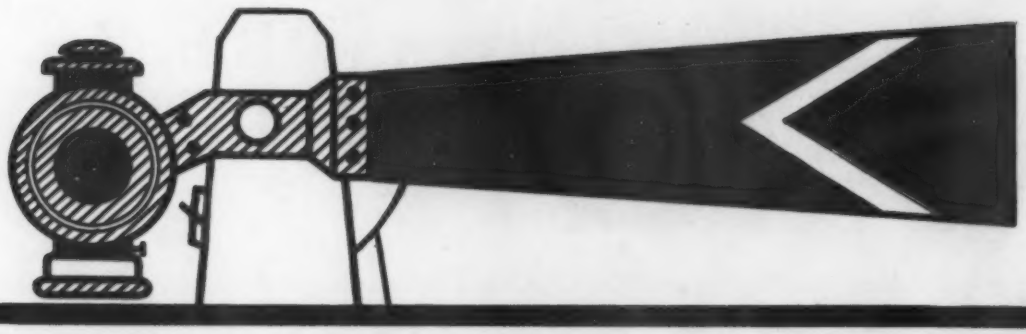
Prospective Purchasers

KELLY TRUCKS				Kelly Organization	
Mechanical Excellence	**Economy**	**Efficiency**	**Increase Field**	**Service**	**Sales Co-operation**
Latest design one and three ton water-cooled models.	Cut delivery costs.	Better service to customers.	Increase radius of operation.	Factory service stations centrally located.	Direct sales co-operation with dealers.
Best materials.	Save barn space.	Quicker deliveries than competitors can make.	Greater mileage.	Quick supply of parts, etc.	Aggressive advertising.
Superior workmanship.	Do not eat when idle.	Advertise owner's business.	Bigger loads.	New York Boston Philadelphia Chicago Cleveland Kansas City San Francisco Seattle Los Angeles Dallas Birmingham	Intelligent publicity.
Seven years of exclusive truck-making—not a "side-line."	Cut down number of drivers.	Can work as long as necessary.	More business for owners.	Gives 100% truck efficiency at all times.	We work on your own list of prospects with you.
The Kelly guarantee.	Decrease delivery cost in every way.	Board of engineers and transportation experts will solve your problems.			Field men to help.
Design two to five years ahead of all others.		Work well in any weather.			Special letters for your prospects.
					Real co-operation in every way.

Write immediately for our Agency Proposition

The Kelly-Springfield Motor Truck Company

605 Burt Street, Springfield, Ohio



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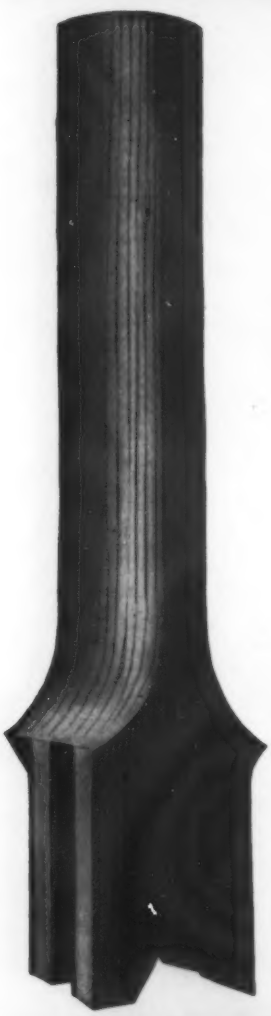


This is just what it looks to be—a danger signal. It is the clang of the bell, the toot of the whistle. It's the sign of a hazardous crossing.

Look Out for the Wheels

When you buy a motor vehicle, don't overlook the vast importance of the wheels, the general principles of their construction, the absolute necessity that they should be strong, safe and enduring. The wheels carry the entire weight and load, they bear all the burdens, they are the first to feel every shock and strain. The safety of the occupant, the value of the load, the ultimate efficiency of the vehicle depends upon them.

All wheels look much alike when they are new. Don't be misled. Insist on wheels that are known to be strong, and safe; the kind that will stand up. Avoid wheel dangers by starting right.

SCHWARZ WHEELS are used by all careful manufacturers, irrespective of the selling prices of their cars, because the material is the best, the design and construction are absolutely correct, the interlocking spokes form a positive assemblage which cannot loosen or work out of true, under the most severe strains. In the motor vehicle lexicon, **SCHWARZ** is a synonym for safety.

Strongest, Safest, Most Economical

The universal verdict of all automobile engineers

Write for booklet "Bear the Burden"

The Schwarz Wheel Company

Frankford, Philadelphia, Pennsylvania

RADIATORS

For heavy trucks and tractors, where weight is not a serious objection, spiral tube radiators are found to be the most rigid and efficient and the only kind which gives adequate service where vibration is great and large radiator service necessary.

Our spiral tube radiators consist of two tanks, top and bottom, connected by ½" seamless brass, 22 gauge tubing, bound spirally with copper ribbon. The tanks are made of leaded iron, covered with waterproof paint. This assures long life and service, as the water cannot rust the material.

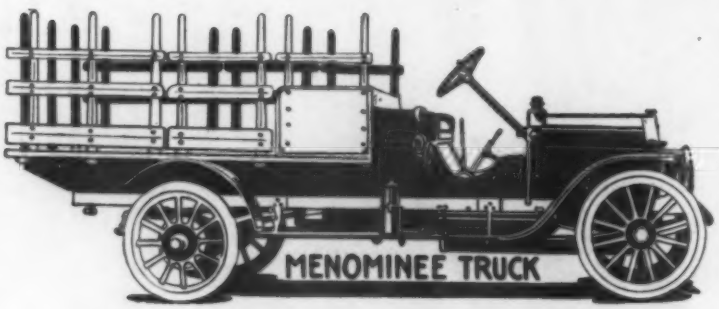
This spiral tubing is made over our exclusive patents and affords results not obtainable with any other.

The honeycomb type for lighter cars maintains an equally high standard, eliminating the objectionable features of other honeycomb types. The tubes run straight from top to bottom, but are given the honeycomb appearance by means of corrugated strips placed between each tube. They are amply large and will not clog up.

Whatever your radiator requirements—we can meet them. Our experts will gladly give advice on your problems.

LONG MANUFACTURING COMPANY
DETROIT, MICH.

"THE MENOMINEE" Motor Trucks



1500 lbs.—Carrying capacity complete with Express or Stake Body - - - **$1200.00**

2000 lbs.—Carrying capacity complete with Express or Stake Body - - - **$1500.00**

3000 lbs.—Carrying capacity complete with Stake Body - - - - - **$1950.00**

THE INTRODUCTION OF "THE MENOMINEE" TRUCK—

was a revelation in delivery motor car development — a demonstration of practicability in motor delivery and facility to render better service.

Combining beauty, strength and utility, it has been most favorably accepted by Department Stores, Grocers, Meat Dealers, General Merchants and Transfer Men, and can now boast of more cars in use than any other truck of its size and price on the market.

4-Cylinder Unit Power Plant

Sliding-Gear Transmission

Shaft-Drive, Transmitting Through Special Reduction Gear

Full-Floating Rear Axle

The season when motor trucks are mostly desired is here, do not delay sending your orders. Try us for prompt delivery and service.

GOOD TERRITORIES STILL OPEN FOR AGENCY PROPOSITIONS

D. F. POYER COMPANY

MENOMINEE MICHIGAN

One-fifth of the power-producing part of your gasolene never gets to your carburetor when you store it above ground.

Some Things With Which You Will Agree

If your dollars were in such shape that, when exposed to the air, they quickly lost their one hundred cent purchasing power and were reduced to eighty cents each, wouldn't you devise some system that would preserve each dollar until it was used? Of course you would.

Well, is there any difference between $10.80 cash and sixty gallons of gasolene, when gasolene sells at 18c per gallon? Haven't you simply changed the actual cash into a volatile liquid?

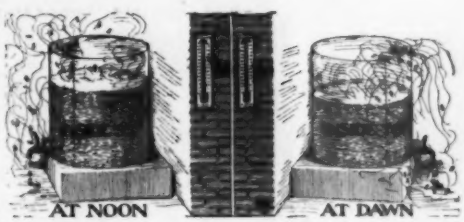
Ninety-nine times out of a hundred, you give a check for the gasolene, which is evidence that you keep your money in a burglar and fire-proof bank for convenience.

Gasolene You Buy is Still Real Money

Now, for some mystical reason you forget that the gasolene you buy is still your money, although in liquid form. As a result, you leave it exposed to every "thieving" puff of wind. If it were still cash—$10.80—you would safely tuck it away where no one but yourself could get it. Being a liquid instead, you carelessly throw it into an "air-tight" faucet tin can or put it into odd-sized containers around your garage.

All of these above-ground containers are subject to every fluctuation in temperature—result—every minute in the twenty-four hours reduces the quantity but more particularly *the quality* of the oils.

Go within ten feet of your "air-tight" can any day when the temperature registers 50° or more and smell the gasolene. If you smell it, you know it is evaporating, and that odor is the vapor power-producing part of your gasolene—it is the pennies you lose in the air.



Gasolene stored above ground fluctuates in temperature from 10 to 20° every twenty-four hours—result—constant formation of vapor, loss of quality, etc.

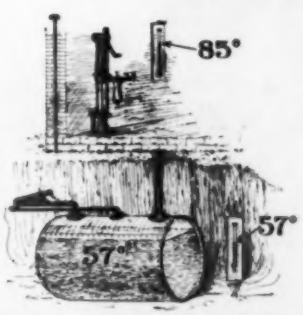
Why Not Use All the Gasolene You Buy?

Ordinary gasolene boils at 113° F. It begins to lose its power-producing vapor at about 50° F.—and it gets that warm almost any day.

No matter how securely your above-ground containers are protected—how tightly capped—there is a constant loss of vapor. Store it underground in a Nature's way. There the temperature hovers close around 57° F. all the year round.

Gasolene is too high priced to be wasted and above-ground storage is bound to waste the best part of it—that power-producing part.

Bowser Safe Oil-Storage System



Gasolene stored underground, where the temperature hardly varies all the year round, retains its full strength.

As Good As An Insurance Policy

Bowser Systems are built to conform to that measure of safety prescribed by the National Board of Fire Underwriters.

They are easily and inexpensively installed—any ordinary workman can do it by following our simple, clear directions. Made and crated ready for your immediate needs, in all styles, sizes and prices.

Send for our new illustrated book and learn more about the conservation of oils—it is mailed free upon request.

S. F. BOWSER & CO., Inc.

HOME PLANT AND GENERAL OFFICES

Box 2118 FORT WAYNE, IND., U. S. A.

Sales Offices in all Centers and Representatives Everywhere

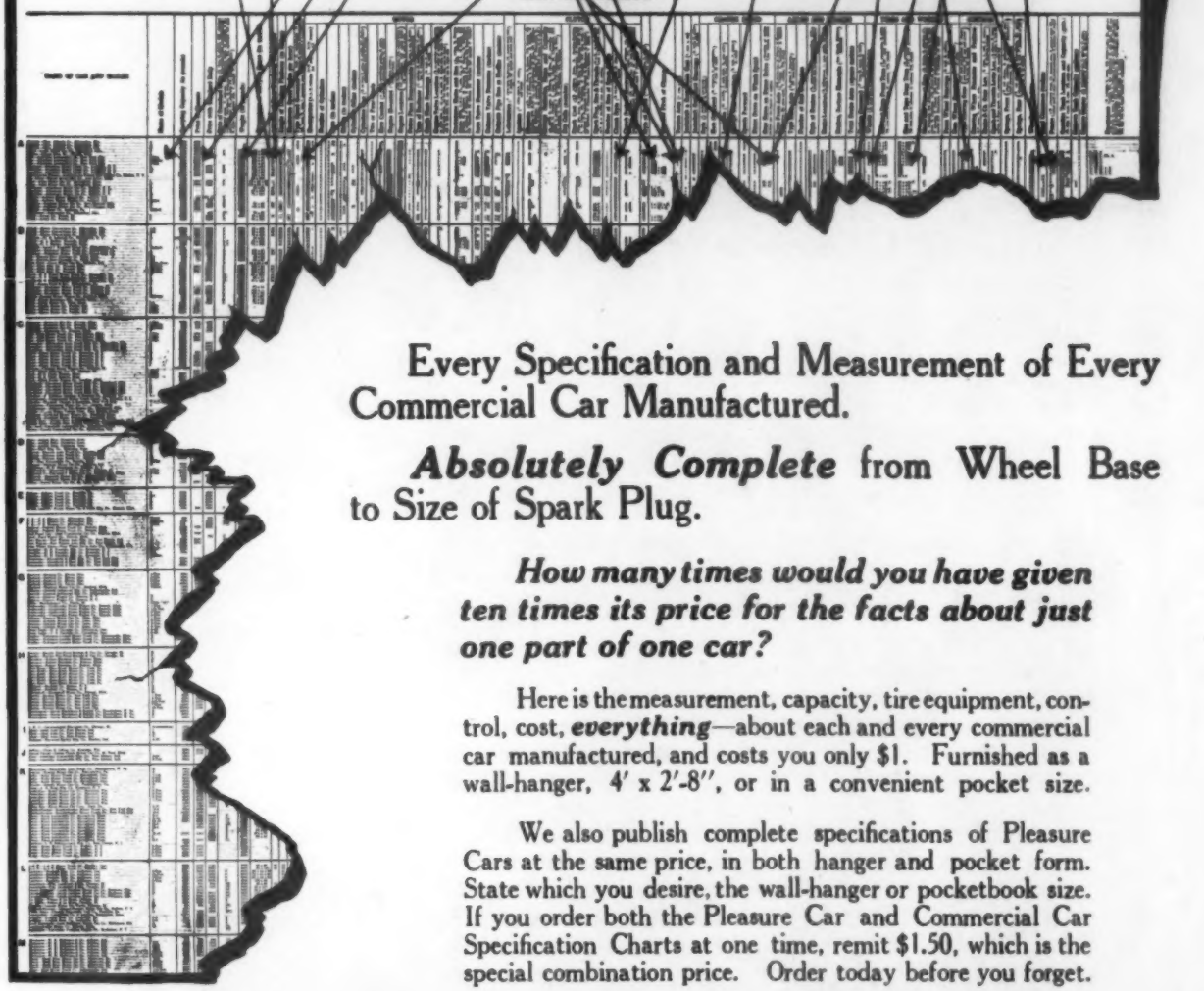
Original patentees and manufacturers of standard, self-measuring, hand and power-driven pumps, large and small tanks, gasolene and oil-storage and distributing systems, self-registering pipe-line measures, oil-filtering and circulating systems, dry-cleaners' systems, etc.

ESTABLISHED 1885

ALL THIS INFORMATION About ALL CARS for ONLY $1

1913 Table of Specifications of Gasoline Commercial Cars

PRICE, $1.00 Issued by THE COMMERCIAL CAR JOURNAL Published in Philadelphia



Every Specification and Measurement of Every Commercial Car Manufactured.

Absolutely Complete from Wheel Base to Size of Spark Plug.

How many times would you have given ten times its price for the facts about just one part of one car?

Here is the measurement, capacity, tire equipment, control, cost, ***everything***—about each and every commercial car manufactured, and costs you only $1. Furnished as a wall-hanger, 4′ x 2′-8″, or in a convenient pocket size.

We also publish complete specifications of Pleasure Cars at the same price, in both hanger and pocket form. State which you desire, the wall-hanger or pocketbook size. If you order both the Pleasure Car and Commercial Car Specification Charts at one time, remit $1.50, which is the special combination price. Order today before you forget.

CHILTON COMPANY, PHILADELPHIA

HYATT QUIET BEARINGS

Flexibility

The smooth, flexible roller of the Hyatt bearing gives under shock but is still rigid enough to carry excessive loads and remain round.

Made of the best quality of alloy steels which in turn are subjected to a uniform and scientific system of testing and treatment in the Hyatt Laboratories, Hyatt Roller Bearings have a strength and stability that insure a maximum factor of safety.

The Flexible roller, by cushioning the shock—absorbing vibrations and giving to strains—reduces noise instead of transmitting and intensifying it as in the case of a rigid bearing.

HYATT ROLLER BEARING CO.
DETROIT. MICHIGAN

Standard

MADE IN DETROIT

THIS is the age of the SPECIALIST. It is a recognized fact that an organization concentrating their entire energies on a SINGLE product, can make a better article at a LOWER PRICE than one that makes a variety of articles.

We are Specialists on 3-Ton Trucks

Likewise the great organizations which produce the component units of the **STANDARD** Truck are specialists in their respective lines. The **STANDARD** is an **ALL-STAR** assembly of the products of the world's most famous specialists. It contains such well-known products as—Continental Motor; Timken-Detroit Axles and Jack Shaft; Brown-Lipe Transmission, Clutch and Control; Gemmer Steering Gear; Perfection Springs, and Spicer Drive Shafts and Universal Joints. It embodies nothing but **STANDARD CONVENTIONAL DESIGN IN ALL PARTS.** No "Features," no new "Ideas," no unproved "Theories"—just **STANDARD** in **EVERY** detail. This policy of Concentration and Specialization, makes it possible for us to produce a Superior 3-ton truck at a very low price.

3-Ton—$2750

Standard Motor Truck Company, Detroit, Mich.

NON-GRAN

NON-GRAN Bearings In Motor Truck Work

This is Why they stand up and keep the truck on the road:—

With the aid of a microscope, you will see that the polished surface of a bearing, instead of being one solid piece, as it appears to the naked eye, is, in reality, composed of billions of minute particles. Now these particles are constantly being pulled at by the friction of the shaft revolving against them,—just as your hand would be pulled, were you to hold it around a rapidly revolving shaft.

The reason a bearing wears out is because these particles cannot resist this pull and are torn away from the billions of particles immediately back of them. As this tearing away of particles goes on, the inside diameter of the bearing keeps getting larger and larger until it no longer holds the shaft snug.

Whether or not a bearing will show rapid wear, depends upon the **structure** of the bronze and how well the constituent particles can **resist** frictional pull.

The structure of NON-GRAN Bronze is the direct opposite of the granular structure of other bronzes in which the particles have no holding bond between one another.

The structure of NON-GRAN is non-granular, it is fibrous. The particles in its construction are all knit together in a solid mass so that friction on the bearing surface cannot pull the particles from their tightly interlocked positions.

The particles of a NON-GRAN Bearing are thus absolutely secure against all normal frictional pull, and give way **only** to the very occasional abnormal pulls such as would be caused by tremendous continued shaft pressures or the almost complete absence of lubricant.

It is clear, therefore, that the reason NON-GRAN Bearings stand up for from three to five times longer than bearings of any other bronze is because NON-GRAN gives way **only** to **abnormal** friction.

The choice of the world's best car manufacturers should convince you.

SIMPLEX · STERLING · HARMON · GARFORD · SAURER · MACK

Do you often see cars and trucks such as these in the repair shop?

Little wonder that cars and trucks of this calibre are so eagerly sought by experienced purchasers

AMERICAN BRONZE COMPANY

Sole manufacturers of NON-GRAN and largest exclusive manufacturers of bearing bronze in the world.

1726-1792 Chester Blvd., Berwyn, Pennsylvania

NON-GRAN

A&R TRUCKS
MEAN FREEDOM
FROM TRUCK TROUBLES

Read This, Mr. Progressive Dealer—

You will be interested in our Special Proposition to Dealers covering the representation and sale of A. & R. Motor Trucks throughout the U. S.

You will be interested whether—

1. You want to add a line of motor trucks to your present line of pleasure cars — or if —
2. You want to substitute an easier-selling, quicker profit-producing line of motor trucks for the line you now represent — or if —
3. You are considering entering the motor truck field under any other conditions, you will find that an A. & R. Agency is the most congenial and profitable connection you can possibly make.

In any event don't sign up with any manufacturer until you have investigated our Special Sales Plan, which includes —

A. The allotting of selling territory.

B. Offers you a special price on your demonstrating truck.

C. And thoroughly covers a time-limited, added-profit offer to Dealers.

You will do well to investigate this proposition to Dealers **immediately,** as we will withdraw our offer Sept. 15th, 1913. Wire or write today for full particulars.

Abendroth & Root Mfg. Co.

SINCE 1867

46 Church Street, New York

Works at Newburgh, N. Y.

A Substantial 3000-lb. Truck For $1775

The above illustration portrays a model C Dart Truck of 3000 lbs. capacity—the truck that has startled the motor truck world because of its low price and superb construction. $1775 for chassis, driver's seat, tools, etc. Body extra. 40 H. P. 4 cylinders. 4 1-16 inches x 5½ inches. Tires guaranteed 8000 miles. Eisemann magneto. Left hand drive. Differential and transmission of chrome nickel steel.

Dart
Motor Trucks

Model E. D., 2 cyl., $750—Model B., 4 cyl., $1300—Model C., $1775.

The Canfield Lumber Co. is successfully operating Dart Trucks at its Waterloo and Cedar Rapids Yards. Dart Trucks are in use throughout the country, and every user will tell you of their low cost of upkeep and exceptionally good service. Write today for catalog and name of dealer.

The Dart Motor Manufacturing Company
Dept. "CJ" Waterloo, Iowa

ACME
Universal Joints

For Motor Trucks—

Accurate—Durable—Efficient
Absolutely Dust-Proof

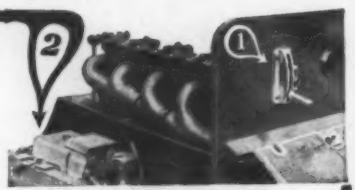
Leading motor truck makers have adopted exclusively the **Acme**, due to improved mechanical features not found on any other universal joint.

We specialize on universals for motor trucks and are in position to meet your every requirement.

Ask for catalog and send your specifications.

ACME UNIVERSAL JOINT CO.
1421 Fulford Street Kalamazoo, Mich.

Make your motor truck as easy to handle and as economical in upkeep as a pleasure car, by installing



SIMPLE—STURDY—ACCESSIBLE

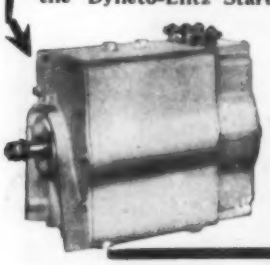
Dyneto-Entz
TRADE MARK

Electric Starter and Lighting System

Don't expect your driver to break his back cranking a big engine. He would rather let the motor run from morning till night. **You pay for gasoline—he doesn't.** When your truck stalls on the road or in traffic, think of the time it takes the driver to get under way again.

Give Your Truck Driver the Dyneto-Entz Starter

The truck manufacturer can make room on any new car for the Dyneto-Entz. On an old car a garageman or mechanic can find room for the Dyneto-Entz. One Switch does away with all other controls. A single unit motor generator not only starts the engine every time, but keeps the storage battery charged. The storage battery can not be overcharged. The wiring is simple.



The Dyneto-Entz means that you never have a Stalled Car. Standard Equipment on Franklin, White, Stewart, Chase and Other Cars.

Write for Full Particulars

Dyneto Electric Co.
Dept. X SYRACUSE, N. Y.

Sales Agent: T. J. WETZEL, 17 W. 42nd Street, New York City

MODERN
THE BOWLING GREEN MOTOR CAR COMPANY

WHETHER YOUR business requires a ¾ ton, 1 ton or a 1½ ton truck, the **"Modern"** in that size is a perfectly designed, high quality proposition, built to give the maximum of service with the minimum of maintenance charges.

There isn't any compromise in materials, proportions or workmanship. Each **"Modern"** stands for the highest degree of efficiency with simplicity that can be built into a truck of its size.

Note the specifications of the 1½ ton **"Modern"**: Timken Axles and Bearings, Brown-Lipe Transmission and 4⅛ x 5¼ Continental Motor.

Prices, chasses only, ¾ ton, $1,350. 1 ton, $1,600. 1½ ton, $1,800. Bodies built to any specifications.

The Bowling Green Motor Car Company
Department "D" BOWLING GREEN, OHIO

BUCKEYE Motor Truck Jacks

Buckeye Motor Truck Jacks are safe, reliable and made to stand the wear and tear for which they are intended. They are fully guaranteed, and cannot possibly drop with a load. They are made from Steel Drop Forgings, best finish and workmanship throughout.

Get our prices before you place your orders for jacks, we can save you money.

No.	Height Bar Down	Raise of Bar	Height Bar Up	Weight	Capacity		List Price
7	11¾"	6¾"	18"	16 lbs.	2½ tons	with formed handle	$10.00
13	14⅜"	7⅝"	20⅛"	26¾ "	3 "		15.00
14	14⅜"	7⅝"	20⅛"	33 "	5 "		16.00
9	11¾"	6"	17¾"	10 "	1¾ "		6.00

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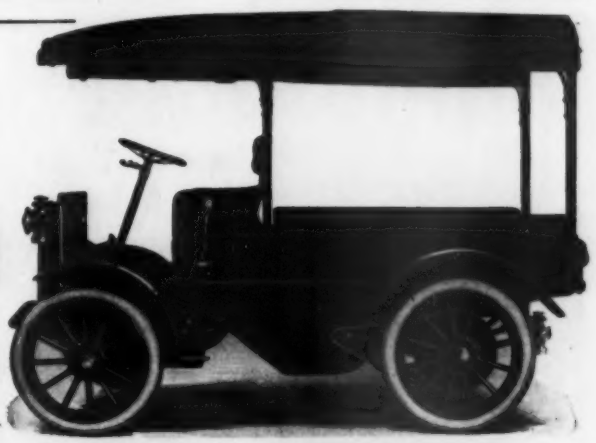
1000 to 1250 lbs. Capacity

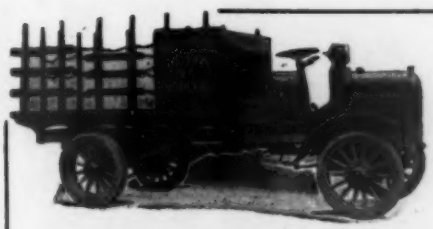
42" x 72" Loading Space

Price, with Top, Pneumatic Tires } $890.00

FLINT MOTOR WAGON DEPT.

DURANT-DORT CARRIAGE CO.
FLINT, MICH.





Model "B" 2-Ton

Chassis $2100

WICHITA TRUCKS

1 and 2 Ton Capacities

Dealers: Write or wire us for sales proposition, territory is being snapped up rapidly.

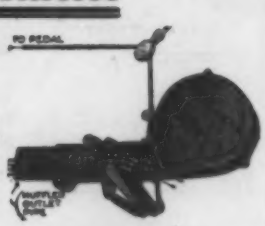
Wichita Falls Motor Company
WICHITA FALLS, TEXAS

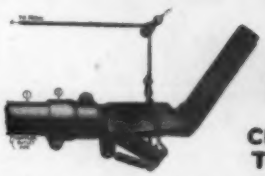
Model "A" 1-Ton

Chassis $1650

Incomparable for Commercial Motor Vehicles

Jericho ONE TONE Horn





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Prices, $7, $8, $9, $10, According to size

The Horns that are always ready and effective; that never clog or get out of order; that eliminate all maintenance expense; that are pedal-operated, leaving the driver's hands free; that are guaranteed for the life of your car.

THE RANDALL-FAICHNEY CO.

Jamaica Plain, Boston, Mass.

Also makers of B-Line Guns, MacKae-Blitz Spark Plugs, Jericho Gas Regulators, and other automobile accessories

USE KEROSENE

CUT YOUR FUEL EXPENSE IN HALF

WITH THE

G. C. VAPORIZER

It **runs any motor on kerosene** and the cheaper fuels **better** than on gasoline, and operates **without carbon, odor** or **smoke.**

Every truck owner and user should learn all about this extraordinary motor improvement by sending for our booklet,

"Use Kerosene as Fuel"

G. C. Vaporizer Company of America, Inc.

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One Gould Storage Battery Tried Means More, Because Users Want More of the Same Satisfactory Service

Trying out a lot of storage batteries on the "Survival of the fittest" plan is expensive, troublesome, and, if you try Gould Batteries first, will be found unnecessary.

Tests thoroughly prove that Gould Storage Batteries combine high capacity and long life to an extent not found elsewhere, and as we base the selection of a battery in each instance upon the purchaser's service conditions, the customer takes no risk.

If your storage battery problems are special, our engineers will gladly advise to your best interests as to the best course to follow.

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Gould Storage Battery Co.

General Offices: 30 E. 42nd St., New York

WORKS: Depew, N. Y.

Agents in all large cities

Full stock carried in all cities where we have offices or agents.

(68)

The Price of Safety

In a great emergency the quality of your brake linings may be the price of safety. If they grip surely and instantly, the threatened catastrophe can be averted. If they fail, disaster follows. Line your brake and face your clutch with

AMBESCO

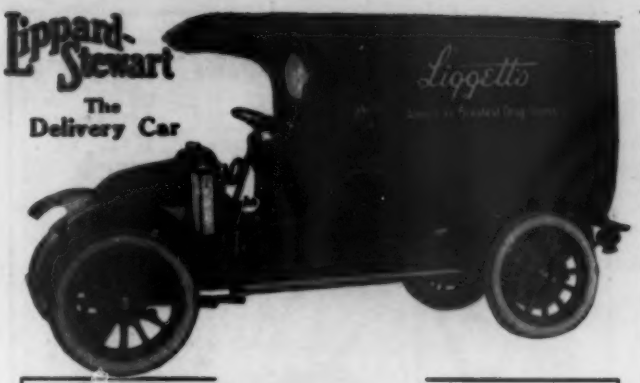
and be certain of avoiding trouble; for the brake lined with Ambesco grips instantly and holds on like a bulldog.

Ambesco is a solid piece of fabric woven with brass wire to give it greater tensile strength and prevent any possibility of disintegration.

It is proof against heat, oil, water and dust, and is guaranteed to have greater life than any other brake linings.

Truck buyers should insist on it for safety's sake; truck builders for reputation's sake.

AMERICAN ASBESTOS CO., Norristown, Pa.



Lippard-Stewart Cars
Guarantee Efficient Delivery

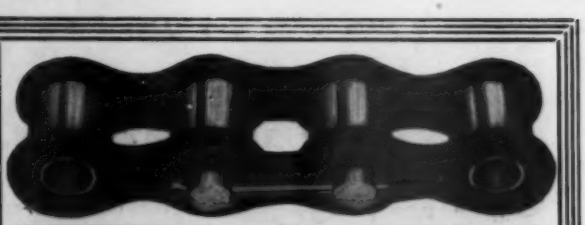
Lippard-Stewart Delivery Cars give service because they are built to give it. They assure quick and dependable delivery over a wide territory at the minimum cost per package, because they are constructed by engineers who know and have fulfilled every requirement demanded of a thoroughly efficient delivery vehicle.

Read These Special Features of Lippard-Stewart Construction

Continental 30 H. P. Motor — Timken Roller Bearings Throughout
Eisemann Magneto — Special Spring Suspension
Brown-Lipe Selective Transmission — Left-Hand Drive
Cone-Clutch — Every Part Easy of Access
Full-Floating Timken Rear Axle — Tires—36 x 4½ Front and Rear

Lippard-Stewart Motor Car Co., Buffalo, N. Y.

AUGUST BECKER .....Pres. & Treas. | J. C. MILLAR .....Secretary.
E. J. BARCALO.....Vice Pres. | C. S. DAHLQUIST ....Chief Engineer.
WILBUR F. REYNOLDS, Sales Manager.



"The Coventry"
Detachable Roller Chain

Note the large heavy-duty cotter-pin connecting the two rivets. The mechanical superiority of this method of coupling can easily be appreciated. Vibrations and jars cannot weaken the double-size coupling as is the case where two smaller cotter-pins, one for each rivet are employed.

Combine the established reputation of "The Coventry" Chains for precision, perfect retention of pitch and unparalleled durability with this final touch of perfection and you will understand why "The Coventry" Chains are consistently specified by those desiring the maximum of transmission efficiency.

Our catalog comprehensively covers "The Coventry" line, and will be sent immediately upon request.

Sarco Engineering Co.
Dept. V 116 Broad Street New York

MONDEX - HELIX GAS MIXER

Used by Manufacturers and Corporations Throughout the United States

Reduces Your Gasoline Bills 25 to 40 Per Cent

SENT PREPAID ON RECEIPT OF PRICE, $5.00; OR C. O. D. IF PREFERRED.

Mondex Shock Preventer
REDUCES YOUR REPAIR BILLS 100 PER CENT

Saves wear and tear of tires and eliminates all vibration.

Motor Car Racing Says: "Mondex Shock Preventers proved they are right in the highest court of mechanical test known."

Write for Booklet "5"

Agents Wanted Everywhere

THE ARISTOS CO., 250 W. 54th St., N. Y.

WONDERFUL!
IS THE PERFORMANCE OF
LANGE TRUCKS
IN PITTSBURGH
DEALERS SHOULD INTESTIGATE

Two years' operation of Lange Trucks under the most trying conditions, has proven that replacements of parts under guarantee is the exception and not the rule; therefore the dealer's commission becomes a real profit and not merely a loan.

WRITE FOR CATALOGUE

LANGE MOTOR TRUCK CO.
PITTSBURGH, PA.

1909 1913

Pioneer
Truck Steering Gear Mfrs.

We make more steering gears for commercial vehicles than any other manufacturer.

WHY?

Because the truck manufacturers recognize that the Lavigne all-steel gear is of superior design and the ultimate user **knows** it.

Standard For:—Commercial Cars, Trucks, Tractors, and High-Grade Pleasure Cars.

Write for Blue Prints

THE LAVIGNE GEAR CO.
STATION A RACINE, WIS.

Swinehart
Cellular Truck Tires

Most resilient solid tire made. Absolutely non-skid. Increases traction and eliminates undesirable slipping and friction. Does away with the use of chains. The holes in the tire act as a radiator, preventing excessive heating and internal friction. The extra large surface of the Swinehart tread reduces the pressure per square inch to a point well within the safe and economical limit.

The wonderful elasticity, due to the combined use of our cellular design and the highest grade of rubber, allowing the tire to "give and take," to stand the road shocks without damage, is the true secret of Swinehart longevity. Demountable Quick Attachable.

We also make a full line of smooth tread and block tires, single and dual.

THE SWINEHART TIRE & RUBBER CO.
AKRON, OHIO
Boston Branch, 727 Boylston Street

Motor Truck Bands

MADE WITHIN THE FOLLOWING

Dimensional Tolerances

(ADOPTED BY THE SOCIETY OF AUTOMOBILE ENG.)

1.—Tolerance in circumference of felloe band:

	Plus	Minus
Before application to wheel - -	1-32"	1-32"
After " " " - -	1-16"	1-32"

Variation from precise measurement shall be uniform over entire width of band.

2.—Tolerance in width of felloe band:

	Plus	Minus
Up to and including 4" - - -	1-32"	1-32"
4—1-16" to 6" - - - - -	3-64"	3-64"
6—1-16" to 12" - - - - -	1-16"	1-16"

3.—Variation in trueness of band when placed on surface plate: Band shall touch at all points within 1-32" up to and including 6" width. Over 6" width within 1-16".

4.—Variation in thickness of band: .006" plus or minus.

5.—Trueness to round. The radial tolerance on the wheel when felloe band is applied shall be 1-16" plus or minus. This plus or minus tolerance must not occur at diametrically opposite points. There shall be no flat spots or kinks in felloe band on the finished wheel.

The Standard Welding Company
CLEVELAND
NEW YORK CHICAGO DETROIT

Continental Motors

A Mighty Power in the Motor Truck Field

75,000 Continental Motors develop 3,000,000 H. P. daily

This tremendous cataract of Continental power is doing a large share of the world's work. In the market place, over crowded city thoroughfares, upon the highways and byways of the open country, in the freight yards — everywhere — it propels great loads of merchandise with sureness and dispatch.

And more. This famous motor is selling the trucks that bear it, is bringing profit to user, dealer and maker, and is building up many commercial car reputations of merit.

Tap this tremendous force of power for your trucks — use Continental energy.

Continental Motor Mfg. Co., Detroit, Mich.
Factories at Detroit and Muskegon, Michigan

The New Tariff—

how will it hit your business? You are asking yourself this *very* question. You are planning to save here, there, and everywhere, in order to profit while competing with foreign goods. This saving must not be confined to the manufacturing end, but must extend to sales and to deliveries.

A saving in deliveries naturally means motor trucks. The *greatest possible* saving in deliveries just as naturally means

PIERCE-ARROW
5-Ton Motor Trucks

because it is the Pierce-Arrow that has that most efficient power conveyor, the worm gear drive—that has the proper distribution of weight, giving great traction with minimum skidding and an appreciable saving in tires—that has the shock-absorbing, easy-riding, flexible construction—the construction that stands abuse.

It will pay you to get well acquainted with the Pierce-Arrow 5-ton Motor Truck.

The Pierce-Arrow Motor Car Company, Buffalo, New York

CROSS-ROLLED STEEL

ARE YOU USING IT ?

Do you realize that by our new method of cross rolling you are able to secure a more uniform, tough and homogeneous steel than has heretofore been possible?

Do you appreciate that pipes and defects are practically eliminated?

All of our Chrome Vanadium, Nickel and Special Analysis O. H. Steels are Cross-Rolled (United).

We would like to give you some facts and evidence as regards the superiority of our product for your requirements.

Write us today —it will not obligate you.

The United Steel Co.

New York Chicago Canton, Ohio
Detroit Cincinnati

Stewart
Delivery Trucks

Output Increased
Opportunity for More Dealers

The Stewart Delivery Truck offers you a selling proposition that is not all **promise.**

Already it is making good for 60 live dealers in 60 cities and towns throughout the United States, Canada and South America. **Already customers** in 42 different lines of trade have been using Stewart Delivery Trucks for months—**and we do not know of a single dissatisfied user.**

Here is the biggest opportunity since the early days of the pleasure car industry. Will you be the one to grasp it?

Act now. Remember the poor dealer's hindsight is the wise dealer's foresight. Send for information today.

Stewart Motor Corporation, Buffalo, N. Y.

T. R. Lippard, Pres. & Mgr. R. G. Stewart, V. P. & Chief Eng.
R. P. Lentz, Sec. & Treas.

Separate and distinct from any other truck company using our name or the names of our officers

SAGER Shock Absorbers

Absolute Necessity for Commercial Cars

SUCCEED WHERE OTHERS FAIL

Endorsed by:

SAURER
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KISSEL KAR
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OLDSMOBILE
ELMORE
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Try a set at our expense

We also make bumpers to protect radiator and other vital parts at front of truck.

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BOLLEE LAUTH-JUERGENS RANDOLPH SEAGRAVE KISSEL GRAND RAPIDS SCHNEIDER KINNEAR PEERLESS RENAULT

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Real Square Tube Radiators

¶ Commercial cars require radiators that will stand many shocks and much hard usage. This was one of the weak parts of the commercial car but the test of time has proved that FEDDERS radiators render efficient service.

¶ We want to figure with you your requirements for the coming season. If you haven't used Fedders radiators you probably have had a great deal of radiator trouble and you may think that there isn't a radiator built that will give you satisfaction. If this is the case we would like to have an opportunity of demonstrating that the Fedders radiator will stand the wear and tear and shocks of the commercial car and that manufacturers who equip their commercial cars with the Fedders have practically no radiator trouble. We can convince you. Will you give us the opportunity?

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BUFFALO :: NEW YORK

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WE SPECIALIZE IN HIGH-GRADE

AUTOMOBILE PARTS

TRANSMISSIONS **GEAR SHIFT LEVERS**
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THE WARNER MANUFACTURING CO.
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KING 3½ Ton Truck

There is no question as to the quality and efficiency of the King. This means low cost of maintenance. If you want a truck that will do real work and stay on the road, it will pay to investigate.

We can give you the service
Territory for reliable agents

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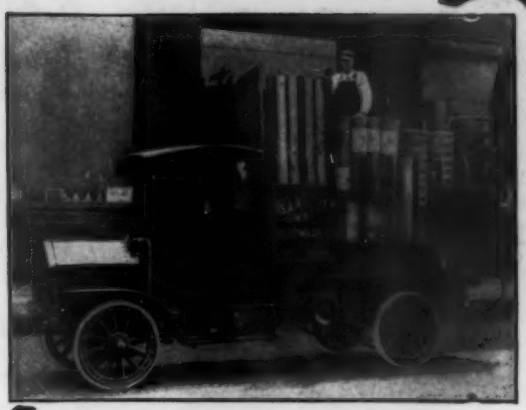
When Writing, Please Say—"Saw Your Ad. in the C C J"



"The Truck That Does the Most Work"

This is the slogan we have adopted for the Avery truck because of its ability to do the big things, haul the big loads, and make the big profits for its owner.

Out of 36 testimonial letters received in one month from satisfied users of Avery trucks, seven of the letters gave the number of horses and men the truck and driver replaced. Adding these together we found that 7 Avery trucks and 7 drivers were doing the work of 86 horses and 26 men. A truly remarkable record. In this comparison as in many others it is shown that Avery trucks are doing the big things. It is because of such records as these the above slogan was adopted.

The Avery line of trucks is complete. All sizes are made from one to five ton capacity. Write for the new truck catalog. It's just off the press. Address:

THE AVERY COMPANY, 950 Iowa St., Peoria, Ill.

The EVANS Model "HELE-SHAW" CLUTCH

The most flexible and powerful clutch in the world. Over 100,000 in actual use. Multiple disc running in oil. The only clutch that is, or can be made with wedge-shaped, annular-grooved, twin plates. This construction makes continuous slippage possible and assures smooth, silent pick-up and absolutely positive engagements. Is most durable, gives absolute control, maximizes safety and eliminates the jerk.

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Note they are constructed entirely different from any other grease cup. The end (B) of spiral spring acts as a pawl catching in corrugations (A) in the cap. When cap is turned the pawl slips from notch to notch holding the cap rigid. *This eliminates any rattle and absolutely prevents cap being lost.* They lubricate perfectly. Made in brass or steel—all sizes. Used by the best car manufacturers.

At dealers or write for catalog 23 and samples

MERCHANT & EVANS COMPANY
PHILADELPHIA
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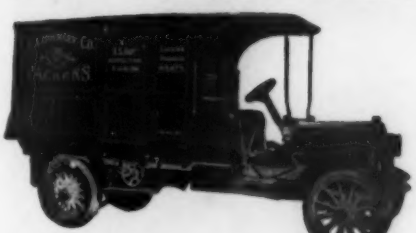
The Rowe Gains What You Value—Time



The average speed of a Rowe three-ton truck is twelve miles per hour. Deduct one-half of the working day for loading, standing idle and unloading (which would be an enormous loss), and you still have five hours for active work, or a possible sixty miles—giving thirty miles under load, which means you could move three tons thirty miles, or nine tons ten miles, which is just 3⅓ times the possibilities as compared with horses.

As a matter of fact, a good truck will easily travel sixty miles per day, and if careful thought is given to saving time at the loading platform, so that long waits are avoided, it would do even more.

A good team of horses can haul a three-ton load at a maximum speed of three miles an hour. Take a ten-hour working day, and deduct four hours' standing time for loading and unloading and you would get a possible eighteen miles of service, providing one-half of the distance was not traveled empty. This really means that maximum tonnage per day for such an outfit would be three tons moved nine miles, or, possibly, nine tons moved three miles.

A line to us will bring you complete information.

Worm or Chain Drive. 1 to 5-ton sizes

Rowe Motor Manufacturing Co.
Coatesville, Pa.
Rowe Sales and Service Co., 647 N. 42d St., Phila.

Steel Tanks

Air-Starter Tanks
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Our extensive manufacturing facilities enable us to meet **your every requirement.**

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GASOLENE STORAGE OUTFITS

B. A. Gramm's Motor Trucks

Newest Designs, Latest Improvements; Built in every detail to insure satisfactory and permanent results.

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Exclusive Motor Truck Builders

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ROSS STEERING and DIFFERENTIAL GEARS

are standard on good motor truck construction

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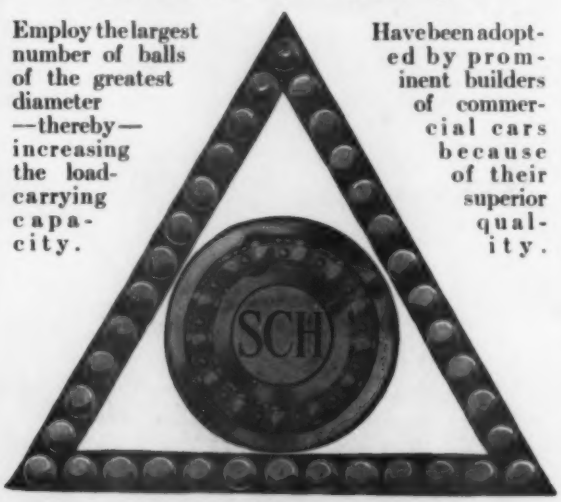
790 Heath St. :: Lafayette, Ind.

3 BIG FACTS YOU SHOULD KNOW
about the Republic Steel Base Motor Truck Tire: 1, that this tire holds securely to the rim and cannot creep, because it is keyed on under high pressure; 2, that you can run it clear down to the hard rubber counterbase without causing chunks of the rubber tread to tear out; 3, that only external road-wear can affect it.
These three features make this motor truck tire more economical and efficient than any other style of tire. Let us give you the full facts and figure on your requirements.
THE REPUBLIC RUBBER CO., YOUNGSTOWN OHIO
BRANCHES AND AGENCIES IN THE PRINCIPAL CITIES
REPUBLIC
STEEL BASE
MOTOR TRUCK TIRE

Schafer Ball Bearings

"Famous for their Durability"

Employ the largest number of balls of the greatest diameter —thereby— increasing the load-carrying capacity.



Have been adopted by prominent builders of commercial cars because of their superior quality.

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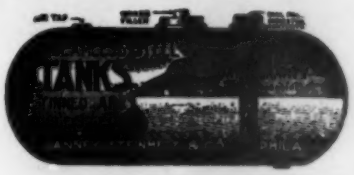

This is the "Jasco Tank"

¶ It is made absolutely seamless and leakless, of drawn steel, thoroughly tinned and tested. It is

THE SAFETY GASOLENE RECEPTACLE FOR THE AUTO

¶ It not only insures the safety of the car and its occupants, but stops the constant drain on pocketbooks caused by waste of gasolene. Made in all standard styles and sizes.

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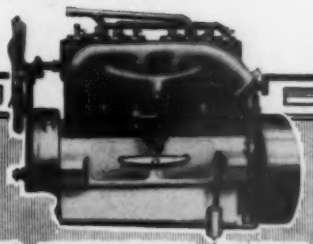

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4½×6¾ LONG STROKE TRUCK MOTOR

EFFICIENCY is the Waukesha Motor's best eulogy. It is efficient because it is constructed to give the utmost in service.

The Waukesha crankshaft has a tensile strength of 70 tons. The bearings have three times the wearing quality of ordinary bearings. Both these metals are our own processes. The rest of the motor is on par with these two features. When we can prove all this, why not ask us to?

Why not learn that you can put a motor in your trucks that will *exceed* your broadest guarantee of efficiency, wear and economy of fuel? Your request will bring proof that will leave no doubt of the Waukesha Long-Stroke Motor's supremacy.

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WAUKESHA Dept. A. WISCONSIN

AN EXCEPTIONAL MOTOR

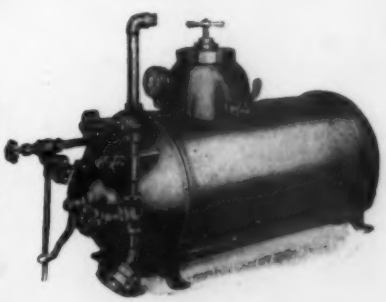
3-Gallon Approved Extinguisher

Chemical Fire Apparatus

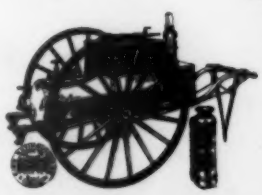
HAND EXTINGUISHERS and TANKS

of every description for department apparatus. We are equipped to make tanks of any size or type.

We also provide a complete line of Chemical Engines, mounted on wheels for service in factories, towns, villages, etc. Hose Reels, Hose Axles, Ladders, Hooks, etc.



35-Gallon Copper Tank



We can equip any chassis complete with body, chemical apparatus, etc. *Ask us.*

O. J. CHILDS CO.
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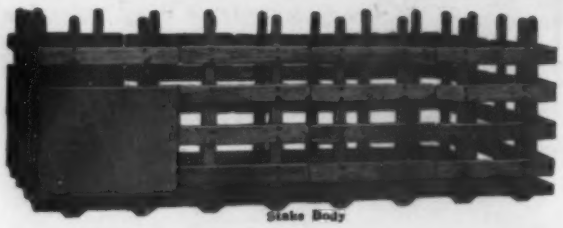
275,577 is the number of a motor that left our factory one bright morning not long ago. It was a wonderful motor—the result of a big and unmatched experience. And the thousand or more motors we are building every day are exactly like it.

More than 275,000 Fords now in service—convincing evidence of their wonderful merit. Runabout, $525; Touring Car, $600; Town Car, $800—f. o. b. Detroit, with all equipment. Get interesting "Ford Times" from factory, Dept. F. Detroit; Ford Motor Company.

HIGHLAND STANDARD BODIES FOR MOTOR TRUCKS



Stake Body

To Standardize is to Economize

The Highland Standard Stake Bodies are manufactured in 27 sizes, and four styles of stake arrangements.

The Highland Standard Flare-Board Bodies are manufactured in 38 sizes, and can be equipped with canopy or screen tops.

The Highland Standard Furniture Bodies are made in 19 sizes, and can be equipped with canopy or screen tops.

From this assortment any Truck Buyer can make a selection best suited to his needs, and is assured of securing a body designed especially for Motor Truck Service. Specify Highland Bodies.

SEND FOR COMPLETE CATALOG

THE HIGHLAND BODY MANUFACTURING CO. - - CINCINNATI, OHIO

BESSEMER owners will tell you it is the best truck for you to buy. Repeat orders prove this.

With 15 years' manufacturing experience why shouldn't we turn out a car mechanically right and with correct design? We believe that there are no trucks on the market offering better values than the BESSEMER line.

1500 lb.	2000 lb.	3000 lb.
$1250.00	$1800.00	$2100.00

BESSEMER MOTOR TRUCK COMPANY, GROVE CITY PA.

CROCE 1500 lb. Delivery Wagon

(Closed Body)

Price, Chassis, $1,750. **Complete, $1,850**

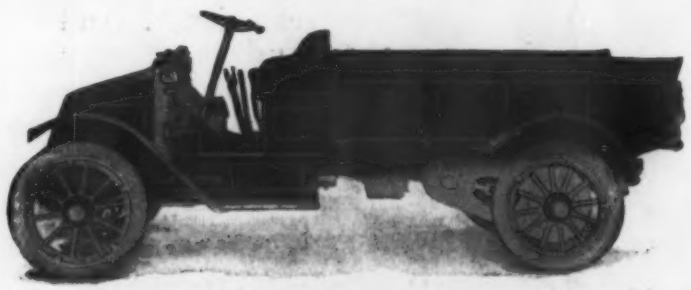
Croce Delivery Cars are worth looking into whether you are agent or purchaser. Our cars are not built for the man that is looking for cheap material. This car is built to last and is built for the man that knows a good car. THE TIME IS PAST WHEN COMMERCIAL CARS SELL BY THEIR LOOKS.

Remember, Mr. Agent, you cannot build up a business of any standing with a fake-it-up proposition and stand good to build up trade. Get that idea out of your head;—this has been done long on pleasure goods and is done every day.

But Commercial cars are different, it must be the best to stand the test and this is none too good. Where are you standing, on cars not making good?

Investigate Croce Trucks. You will thank yourself if you do. This is the time to do it. Send for Catalogue (A)—that will tell you what the Croce Cars are made from.

CROCE AUTOMOBILE COMPANY : Asbury Park, N. J.



Sandusky Model "B" 1500 lb. Delivery Truck
Price complete, as shown, $1500.00

Constructed for hard business service—not of pleasure-car type.

Designed for economical operation.

Long stroke, 30 H. P., 4 cylinder, 4 cycle **motor,** equipped **with governor** to control speed.

Selective sliding gear **transmission.**

Double chain drive with chains enclosed.

Center control with left-hand drive.

QUIET and absolutely RELIABLE.

Not an assembly proposition, but manufactured by us in our factory, as is also our 1½ ton truck.

Write us. Do it today.

Sandusky Auto Parts & Motor Truck Co.
Sandusky, Ohio, U. S. A.

When Writing, Please Say—"Saw Your Ad. in the C C J"

We Ship on Approval

prepay freight and allow

30 DAYS FREE TRIAL

The best "Nonskid" puncture-proof device on earth for Commercial Cars.

Try them at our expense. Be your own judge—don't take anyone's word for it. *"The proof of the pudding is in the eating."*

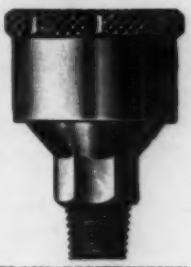
It Only Costs One Cent

to learn our unheard of prices and marvelous guarantee on "Brictson" Detachable Treads.

Write today for full particulars

The Brictson Mfg. Company

4373 BRICTSON BLDG. BROOKINGS, S. D.



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(Patented)

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BRASS AND STEEL

GREASE AND OIL CUPS

WE MANUFACTURE

a full line of Plain, Leather Packed, Ratchet, Marine, Spring Compression, and many other styles of Grease Cups.

Our line of Oil Cups is equally satisfactory and complete.

Catalogue on Application

SPECIAL SPRING COMPRESSION
(Patented)

Bowen Manufacturing Co.

AUBURN, N. Y.

How Much Money Do Your Motor Trucks Waste?

If you could be with each vehicle for one day, you would be amazed at the time that is lost at loading stations and on the road—Time that you could save if you knew about it. This waste of overhead charges and investment costs you more than the *waste* of fuel, oil and repairs combined.

Do you know exactly how many hours each of your vehicles worked yesterday? When they were idle—for how long? If you had a daily chart—accurate, easily read—showing these facts, you could save hundreds of dollars a year.

THE SERVIS RECORDER gives such a record. It has no gears, shaft or outside connections. It will pay you to investigate. Write or phone for literature and names of owners.

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Branches in Twelve Cities

"Reliable Springs are More important on Commercial Cars than on Pleasure Cars."

THE PERFECTION SPRING CO.

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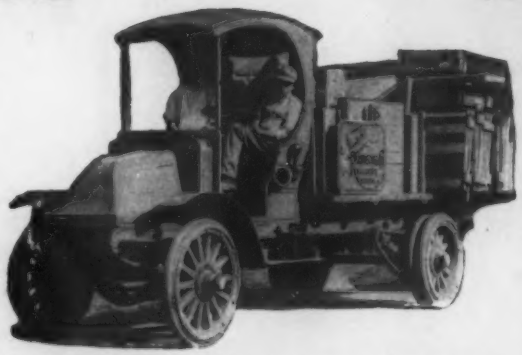
"Deliver the Goods"



ANALYZE CAREFULLY the features that the motor truck you require must have, and check them off as you study the Adams.

You'll find it free from complications, with straight-line connections throughout, left-hand drive, protected radiator, instantly accessible motor and an excess of every factor that makes for safety and satisfaction.

Write today for complete literature

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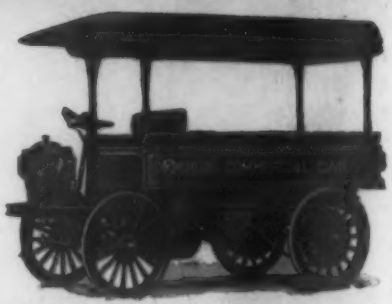
438 West Main Cross, Findlay, Ohio

First American Truck Manufacturers to use the French Type Hood (Radiator rear of the motor.)

"DEALERS—THIS IS YOUR OPPORTUNITY TO GET IN THE TRUCK BUSINESS RIGHT."

You can get in the business and get in right without tying up a whole lot of capital.

Every store and business in your territory is a prospect. Just figure out for yourself where that fellow around the corner or across the street from you could get a better buy than the "KOEHLER." Ask him the carrying capacity of his horse-drawn vehicle, its value and its running cost. Put it down on paper and alongside of it figure out the cost of the "KOEHLER." $750 for a 1600-pound capacity commercial car, and $15.00 per month will cover the cost of storage, gasoline, oil and everything. These figures will not only be lower than his present equipment, but, in addition, one "KOEHLER" will do the work of three teams.



1600 Pounds Capacity and only $750

Write us about it,—we want to show you just how little capital will put you into a real profit-making business. Even if you are not already in the automobile business, write us,—a mechanical knowledge of the automobile is not absolutely necessary,—just a little capital and a whole-hearted, red-blooded desire to make good.

SPECIFICATIONS: Motor, 24 H. P., 2 cyl., Water-Cooled; Positive Mechanical Lubrication; High-Tension Bosch Magneto; Planetary Transmission running in constant oil bath; Wheels, 36"; Tires, 2½", solid, fitted on demountable rims; Wheelbase, 90"

Write at once for full particulars

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World's largest Manufacturers of Ignition

THE best authorities agree that your truck investment will not be profitable unless the service is continuous. The one and only way to guarantee continuous service is to guarantee 100% efficient ignition with the famous Remy Magneto.

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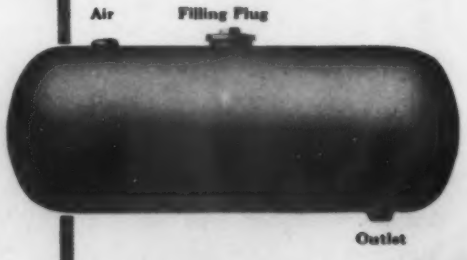

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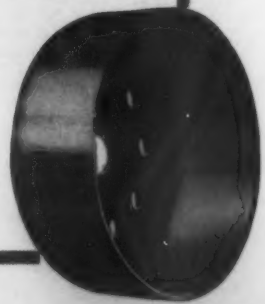
Any Diameter, Gauge or Height



Federal Pressed Steel Co.
Milwaukee : Wisconsin

Prevent Motor Truck Accidents by Using Brake Lining of Quality

LINE YOUR BRAKES WITH

TRADE MARK **Raybestos** REG. U.S. PAT. OFF.

"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"

It grips and holds—not merely when new, but after months of service. Its durability makes the truck safe at all times. Woven of genuine long fibre asbestos, it cannot burn out. RAYBESTOS is practically indestructible. We stamp the name on every foot for your protection.

The Standard Brake Lining of the Industry

THE ROYAL EQUIPMENT CO.

Railroad and Bostwick Aves.
BRIDGEPORT, CONN.

We also make Raymond and Duplex Brakes and Gyrex, the Mixer

Budd ALL STEEL Bodies

represent the last word in the art of truck body building. They stand for strength, stability, sturdiness and efficiency. Made entirely of steel, they will not rot or crack. They cannot warp or split. They will stand the maximum use or abuse and are practically indestructible. They eliminate fire risk. They are light in weight and easy on tires—pleasing in design and attractive. Summed up in a word, they give the highest degree of Service.

They are made in many styles—of any desired capacity. Estimates promptly furnished. Write us today for full information.

Edward G. Budd Manufacturing Co.

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Force-Feed Oilers with two compartments

Detroit Force-Feed Oilers are made with **two** compartments (as well as one) for feeding two different kinds of oil. One compartment feeds gas-engine oil to the cylinders—the other feeds a cheaper, heavier oil to the bearings, etc.

The use of the second compartment gives an accurately measured feed to each part, a completely centralized system and freedom from all annoyance, wasted oil and damage to the engine.

For every kind of truck

Detroit Oilers are made in styles and sizes for every type of gas engine—commercial truck, automobile, marine, stationary, gas tractor—with any kind of drive and every provision for easy installation.

Once adjusted, it never has to be regulated. The quantity of oil fed is automatically regulated by the engine speed.

Write today for catalog P-67 and full information.

DETROIT LUBRICATOR COMPANY.
DETROIT, U. S. A.
Largest manufacturers of lubricating devices in the world.

Send For This Free Booklet

For the owner, or for the man who finishes autos and carriages, this little booklet entitled "The Care of the Car," will be found full of practical suggestions.

It tells the owner how to keep his car in the best of condition and what to specify when having the car done over.

It demonstrates to the finisher why permanent results pay best and why no job need "go wrong."

It contains a number of popular color samples and a novel plan for showing how they will look when put on a car.

You should have this booklet. There's a copy waiting for you. Send coupon for it *today*.

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VALENTINE & COMPANY, 456 Fourth Ave., N. Y.
Name.....
Address.....
Send me copy of your booklet, "The Care of the Car."

THE RUTENBER MOTOR

Manufactured since 1901 for high-grade

Automobiles and Trucks

3¾ x 5¼ four and six cylinder
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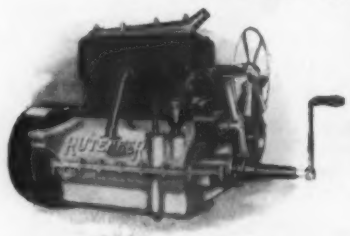
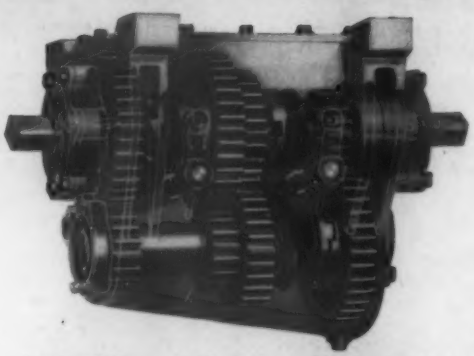
Standard or Unit
and
4 x 4, 4½ x 5 and 4¾ x 5 Standard Types
All L-Head, 4-Cycle



Manufacturers are invited to investigate our service and our facilities. Literature on request.

The Rutenber Motor Company
MARION, INDIANA

COTTA TRANSMISSIONS



Internal View of Shaft-Drive Transmission, designed for use in worm-drive trucks

For Heavy Truck and Tractor Service
Eliminate Transmission Trouble

Selective type, individual clutch system. All gears always in mesh. Countershaft and mainshaft gears idle on direct. Improved speed-changing device. No plain bearings —loose gears mounted on roller bearings.

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The **Commercial Car Journal** is universally recognized as the finest publication in its field.

Horse, Truck and Tractor is written especially for horse-owners who find their horse-profits decreasing. This book has been written in collaboration by three experts in their respective fields—

HERBERT N. CASSON, L. W. ELLIS and ROLLIN W. HUTCHINSON, JR.

Many of the facts are startling in their magnitude. As these writers claim that the total horse-cost is now $2,000,000,000 a year for maintenance alone, the problem of displacing horse-power by trucks and tractors is one of great interest to all concerned.

In offering you an annual subscription to the **Commercial Car Journal** and a copy of the book, **Horse, Truck and Tractor,** for $2.00, we are presenting an opportunity for you to obtain the greatest amount of valuable information on this important subject at the smallest cost.

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COMMERCIAL CAR JOURNAL
Market and 49th Sts. PHILADELPHIA, PA.

SPLITDORF

"Always There"

Reduce the Motoring Tariff

by insisting upon SPLITDORF PLUGS whenever and wherever you find spark plugs that really SPARK, are needed.

"COMMON SENSE" in name—they are common sense in every detail, being gas-tight, soot-proof and unbreakable. SPLITDORF PLUGS don't short-circuit or carbonize.

Look for the SPLITDORF trade-mark stamped on the plug and insist upon the hexagonal porcelain —none other is genuine.

For automobile, motor truck, motorcycle and motor boat—for any engine at any speed—use SPLITDORF PLUGS.

Remember, all! "New ignition for old" is our slogan—we have a SPECIAL EXCHANGE proposition of the greatest interest to every owner of a gasoline motor who would save time and money. Write or call TO-DAY for particulars.

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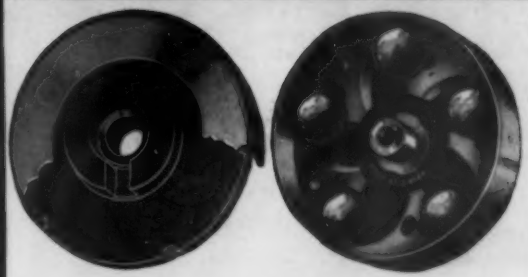


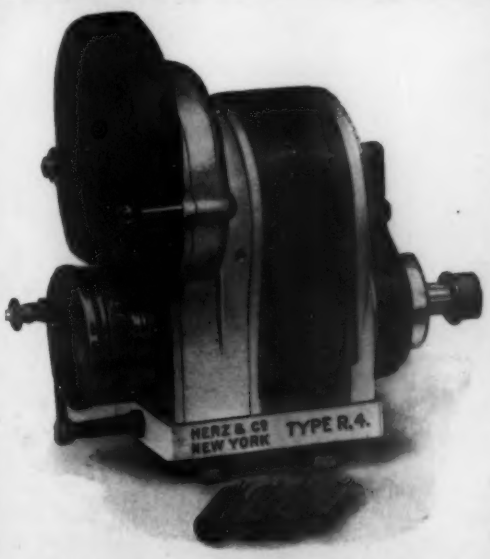
HERZ AUTOMATIC TIME ADJUSTMENT

This simple device marks a tremendous advance in ignition methods from the viewpoint of economy, efficiency and also convenience. In a single step, it has eliminated entirely all pounding and the possibility of back-kicks, reduced gear-changing to the minimum, effected a material saving in gas consumption and insured the maximum efficiency of the motor. It is absolutely noiseless, and can be attached to any Magneto.

The spark is advanced or retarded automatically in proportion to the speed of the motor. This insures the spark of greatest possible efficiency at all speeds.

That the HERZ MAGNETO is far superior to any other make, for use on Commercial Cars especially, is abundantly proved by recent tests which have established to a certainty the fact that this magneto is the strongest of its size and weight in the world. In the official English Test against 15 competitors, HERZ MAGNETO gave a hot, efficient spark at 35 R.P.M. as against 45 R. P. M. for its nearest competitor.

Use the **HERZ MAGNETO** with
HERZ AUTOMATIC TIME ADJUSTMENT



HERZ & CO., 295 Lafayette St., NEW YORK
Manufacturers of the HERZ PLUG ("Bougie Mercedes")

Looking out at the new factory extensions made necessary by our increased business reminds me of my prophecy that the Alkaline Storage Battery would bring about important changes in transportation

Thomas A Edison

EDISON
STORAGE
BATTERY
COMPANY

141 Lakeside Avenue
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The Krebs--The Car That Thinks

Its Governor Adds Economy to Safety

THE more you study the motor truck proposition, the more you realize that a governor is a vital necessity for such a car.

COMPARISON with all others will show you that the governor of the Krebs, being the only *variable* governor, is the greatest step thus far taken on this important subject.

THE speed control of the Krebs is based on fuel supply—the very essence of economical handling. Acting independently of the driver, it evenly maintains the speed desired, up hill and down, never exceeding the maximum previously determined by its owner.

THE driver is free to watch traffic conditions. He has nothing to do but steer. He can't mishandle the motor, which is operated—by the Krebs governor—with an automatic skill which human hands cannot equal.

Model BB ¾-ton Krebs. Price with screened body as shown - - - $1,600
100-in. wheel base, 3¼ by 4½ four-cylinder, 4-cycle motor
Price of Chassis only - - $1,425

THE KREBS COMMERCIAL CAR CO., Clyde, Ohio

STANDARD
Adjustable Taper Roller Bearings

After exhaustive tests, S.R.B. Taper Roller Bearings have been selected by the following motor truck manufacturers for use in their wheels:

Peerless, Packard, Kelly, Seagrave, Atterbury, Babcock, Blair, Mack, Brockway, Chase, Hatfield, Harwood-Barley, Jeffery, Kissel, Mais, Poyer, Modern, Reo, Rowe, Sanford, Schacht, Selden, Service and many others.

The Rolls of S.R.B. Taper Roller Bearings offer an effective bearing surface over their entire length, thus giving the bearing a greater radial load capacity for a given width of bearing than is possible with any other design.

The large shoulder on the Cone allows of the bearing taking a maximum end thrust with a minumum wear.

For prices and further data, write,

STANDARD ROLLER BEARING COMPANY, Philadelphia, Penna.

FRAMES

For Pleasure Cars
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Trucks

Any size
Any design
1/2 ton to
10 ton

Stability

Just as the frame determines the stability of the truck, so do years of past success guarantee to the customer the quality of the service rendered by a manufacturing organization. In the instance of the

HYDRAULIC PRESSED STEEL COMPANY

this dependability of service depends upon three factors—

First—An unparalleled experience in the production of motor vehicle frames.

Second—An equipment continuously and strictly maintained to meet the standards of modern engineering efficiency.

Third—An organization so trained in the handling of this equipment that not only is every product of unvarying quality but each order is filled on schedule time.

The Hydraulic Pressed Steel Co.

3152 East 61st St.
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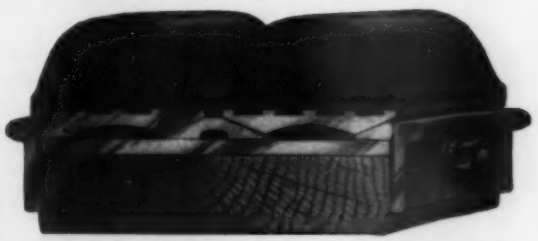
3 Saving GOODYEAR AKRON, OHIO Truck Tires



Goodyear Solid Demountable Truck Tire

Here's a **heavy-truck** tire that's the easiest in the world to put on and take off.

Goodyear Individual Block Truck Tire

If you have a heavy truck that requires exceptional traction and non-skid tires, fit it with **Goodyear Individual Block Truck Tires** on rear (single demountable on front). No extra tire equipment to carry. Independent of tire applying stations. Each block held by fastening of its own. Put on and taken off easily—no time lost! Work saved!

In a great many cases where conditions are such that it is not feasible to use Demountable tires, the

Goodyear Solid Side Flange Truck Tire

is exactly what you want. Diagonal cross wires imbedded in its base absolutely prevent creeping. Fits directly to the S.A.E. band and held in place by clincher side flanges. It is the work of but a minute to either apply or take off.

4 OTHERS

Don't think of investing in truck tires until you know the countless **saving** features of Goodyears. Four other tires—each a money saver, each the result of over 14 years tire experience. Booklet on Truck Tires describes them all. Write for it at once. Address

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Branches and Agencies in 103 Principal Cities
We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits
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$800.00 MERCURY TRUCKS $800.00

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1000 POUNDS CAPACITY

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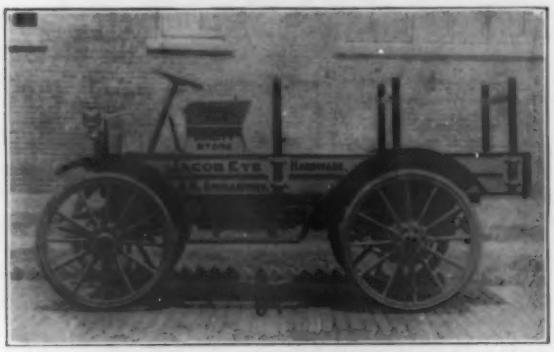


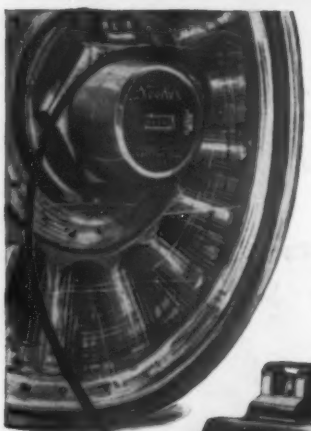
EQUIPPED PER PHOTO: FENDERS, LAMPS, HORN, STAKES, WITH CLEAR 10 FEET INSIDE.

THIS CAR $800.00, OTHER MODELS $750.00 TO $900.00

AGENTS—WE WANT YOU TO GROW UP WITH THE MERCURY

WRITE AND GET OUR PROPOSITION

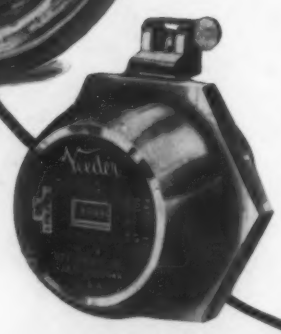
THE MERCURY MANUFACTURING COMPANY, 4106 S. HALSTED ST., CHICAGO, ILL.



Stops All Guesswork

Veeder

Hub Odometer



$25

At Your Dealer's or Direct From Factory

You would not tolerate for a minute any guesswork in any other part of your business. Just suppose your book-keeping department guessed the sum total of a column of figures. It is absolutely necessary for you to keep an accurate record of your truck service and the VEEDER HUB ODOMETER is the only device that will guarantee you accuracy. It registers backward as well as forward. It is sealed so that it can not be tampered with or altered. It is built as sturdy as any part of your truck, and simply takes the place of a hub cap.

No Intricate Wiring, Magnets, Cables or Tubes

Can be attached by any mechanic. Simply send make, model, size of wheel and year your truck was manufactured.

THE VEEDER MANUFACTURING CO.

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Most extensive resources and plants in existence devoted exclusively to ball bearing manufacture. Enlarging and improving facilities, product and capacity for distribution.

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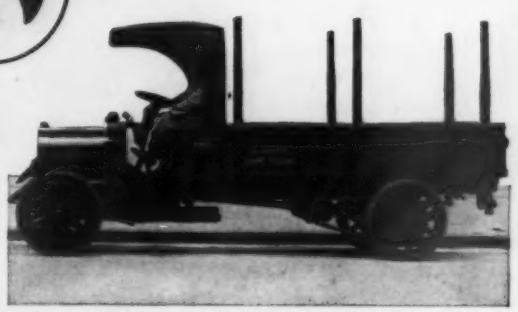
666 North Broad Street	1974 Broadway	1800 Michigan Avenue

Our unbounded confidence in

The Selden Truck

is evidenced by the fact that we are selling it

On the Time Payment Plan



We are pioneers in the movement to put the motor truck on the same basis with other business necessities and to sell it upon terms that make it easy for the average merchant and manufacturer to purchase.

The SELDEN TRUCK for $2000 is built to provide each purchaser with a safe and profitable investment. That is why it is the sturdiest and best one ton truck ever produced.

The truck purchaser who takes advantage of our sales plan has a chance to try out his truck in actual service **while it is earning its own payment.**

$500 in cash covers the initial payment on **The Selden Truck** and the purchaser is granted a whole year in which to pay the balance.

Agents with first class sales and service facilities wanted in unassigned territory

Selden Truck Sales Company

211 East Avenue **Rochester, N. Y.**

When Writing, Please Say—"Saw Your Ad. in the C C J"

Capacity One Ton

"LITTLE GIANT"

EVERYTHING THE NAME IMPLIES

A giant in performance but a dwarf in maintenance. Great carrying capacity, but low cost of upkeep. Remarkable value but very moderate price. These are the three great factors wanted by every keen motor truck buyer. You get them to a remarkable degree in this proven success which is making good everywhere and in every line of business.

Any Style of Body

DEALERS

This is a car that will be profitable for you to handle. Here are a few reasons why it will put dollars in your pocket — Its unusually good value; its price is within every merchant's reach; its cost of upkeep is small; it is giving absolute satisfaction in scores of different lines of work and to thousands of owners; there is but one chassis, to which can be fitted every style of body — hence requires but a small investment on your part; it is backed up by a powerful company whose reputation and integrity stand back of every sale; it is a rapid seller, a sure repeater and a good profit earner. Some territory is still vacant — write today for our proposition.

WRITE FOR PRICES AND TERMS

CHICAGO PNEUMATIC TOOL CO., General Office, 1010 Fisher Building

Branches Everywhere. New York Office, 50 Church Street

ASK THE USER

If you want good, first-hand information about the saving in fuel, the full compression, the reduced carbonization and the absence of smoking, effected by the

LEAK-PROOF PISTON RING

ask any user. The chorus of approval you will get will be so convincing that you will need no further argument regarding the advisability of using them in your motor.

LEAK-PROOF RINGS are simple in construction, but thoroughly efficient in practice. The vapor cannot escape from the combustion chamber and the lubricating oil cannot get into it when properly fit. **LEAK-PROOF RINGS** are the only ones which effectively do this.

DEALERS—Our sales proposition is mighty good—write us about it.

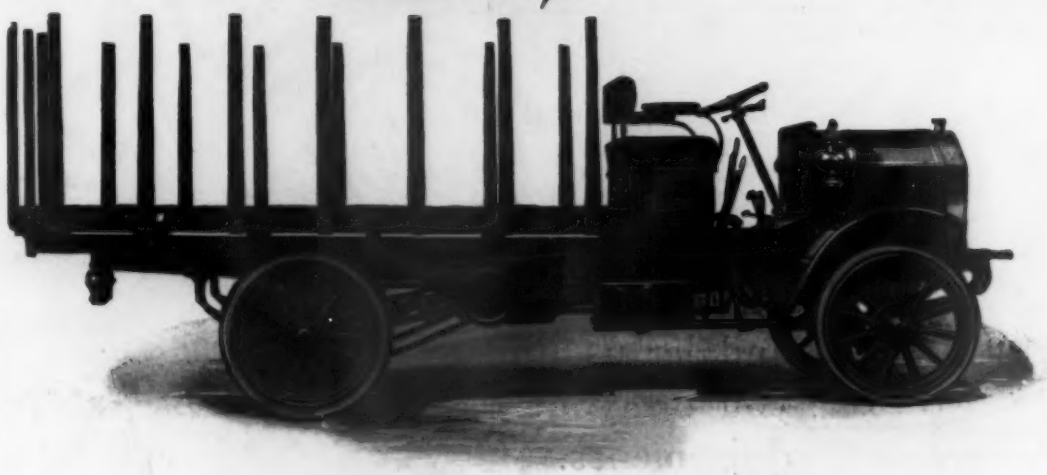
McQuay-Norris Mfg. Co., Dept. C

1309 Chestnut St. St. Louis, Mo.

NEW YORK, N. Y. 53 Lincoln Sq. Court, Broadway at 64th St. | CHICAGO, ILL. Suite 39 Merchants Bldg., 105 N. La Salle | PITTSBURGH, PA. 7630 Tioga Street | KANSAS CITY, MO. 1502 Grand Ave. | LOS ANGELES, CAL. 322 Central Building | PORT WORTH, TEXAS 108 Bryan Avenue | SAN FRANCISCO, CAL., 208 Market Street

When Writing, Please Say—"Saw Your Ad. in the C C J"

2 Ton THE Rockford Price $2,500



Considering quality, this truck is the best value in the market to-day. Every part selected with the greatest care, regardless of cost. Ask us for particulars. **A few good agencies are open.**

ROCKFORD MOTOR TRUCK CO. :: ROCKFORD, ILL.

Michigan Steel Casting Company

DETROIT, MICHIGAN

Quick Deliveries on Steel Castings

Our equipment makes it possible to handle your rush orders promptly without any sacrifice of quality

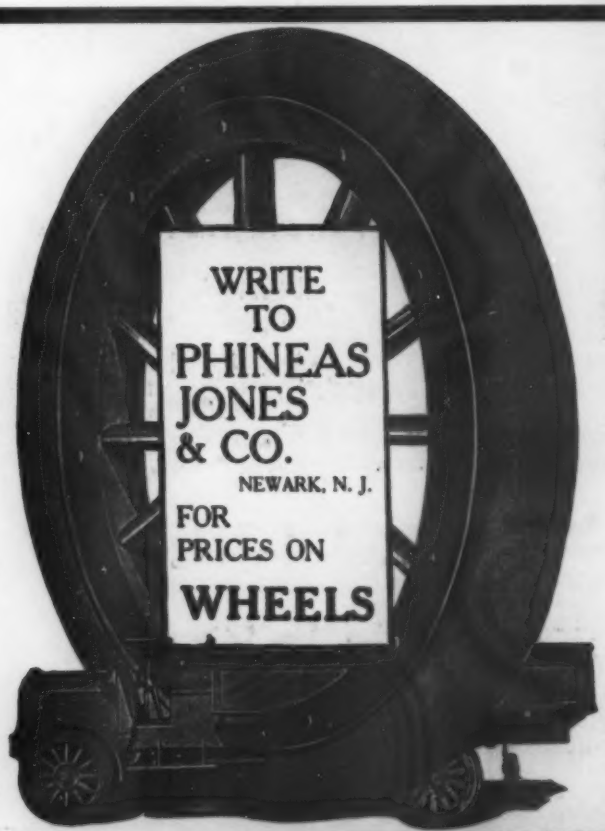
When Writing, Please Say—"Saw Your Ad. in the C C J"

CULLMAN SPROCKETS and Differentials

in stock and to order.

Send for catalog and let us quote you on your requirements.

CULLMAN WHEEL COMPANY, CHICAGO
1351 GREENWOOD TERRACE



AUTOMOBILE WHEELS for PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty

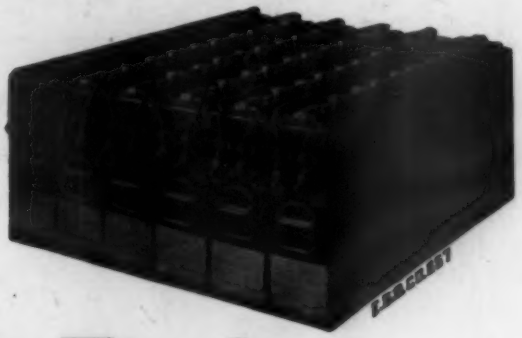
Experimental wheels a specialty

We furnish and apply any style demountable or detachable rim or tire

BEST ON EARTH—KANTSAMORE
ESTABLISHED 1855

PHINEAS JONES & COMPANY
305-313 Market Street :: Newark, N. J.
Branch Factory: 12th Avenue and 55th Street, New York City

You Don't Need to Experiment With Batteries For Your Electric Trucks



Here is a list of some of the largest and most prominent users of electric commercial cars in the country. They all use

The "Exide" Batteries

"Exide", "Hycap-Exide", "Thin-Exide", "Ironclad-Exide"

American Express Co.
Gimbel Bros., New York and Phila.
Anheuser-Busch Brewing Association, St. Louis
Philadelphia Electric Co.
Jacob Ruppert Brewing Co., New York City
F. A. Poth & Sons, Philadelphia
United States Express Co.
Marshall Field, Chicago
Commonwealth Edison Co., Chicago
R. H. Macy & Co., New York City
United States Government
United States Post Office Service
Rochester Railway & Light Co.
H. C. & A. I. Piercy, New York City
Woodward-Lothrop, Inc., Washington
Louis Bergdoll Brewing Co., Philadelphia
James A. Hearn & Sons, New York City
Gorham Co., New York City
B. Altman & Co., New York City
Union Electric Light & Power Co., St. Louis
Halle Bros., Cleveland
Geo. Ehret, New York City
C. Schmidt & Sons Brewing Co., Philadelphia
United States Navy Yard, Washington
Tenney Syndicate, Boston
United Gas Improvement Co., Philadelphia
Krey Packing Co., St. Louis
Edison Electric Illuminating Co., Brooklyn
Borden's Milk Co., Brooklyn
Brooks Bros., New York City
Consolidated Gas, Electric Light & Power Co., Baltimore
New York Edison Co.
Chapin-Sacks Manufacturing Co., Washington
H. B. Claflin Co., New York City
Public Service Corporation, Jersey City
Bernheimer & Schwartz, New York City
Loewers V. Gambrinus Brewery Co., New York City
Arnold Constable & Co., New York City
United Electric Light & Power Co., New York City
General Electric Co.
Union Transfer Co., Philadelphia
John Wanamaker, New York and Philadelphia
Amoskeag Manufacturing Co., Manchester, N. H.
Meir and Frank, Portland, Ore.

In following the judgment of such expert battery users, you cease experimenting. The people who buy the most batteries are the best judges of the best battery to use.

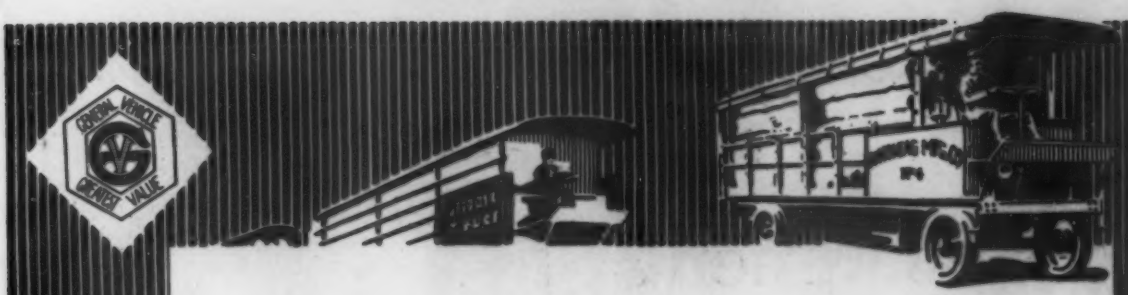
Investigate the Four "Exide" Batteries. Each is adapted for a special electric vehicle service. Our nearest office is at your service.

THE ELECTRIC STORAGE BATTERY CO.

Manufacturer of The "Chloride Accumulator," The "Tudor Accumulator," The "Exide," "Hycap-Exide," "Thin-Exide," and "Ironclad-Exide" Batteries.

New York Boston Chicago **PHILADELPHIA, PA.** Denver San Francisco Seattle
St. Louis Cleveland Atlanta Detroit **1888-1913** Los Angeles Portland, Ore. Toronto

876 "Exide" Distributors 9 "Exide" Depots "Exide" Inspection Corps



G. V. Electric Trucks

Over 3000 G. V. Electric Trucks and Wagons are now in daily service, many of them from six to eleven years old.

The General Vehicle Company, Inc., has been the pioneer of the world in developing and standardizing Electric commercial vehicles. Its growth has been slow and sure. Production facilities will be tripled this year, because the G. V. reputation for building a high-grade product and selling it as road transportation machinery should be sold, has made this expansion necessary.

Before you motorize—yes, before you buy even your first truck—you owe it to your business to thoroughly investigate our product and our standing.

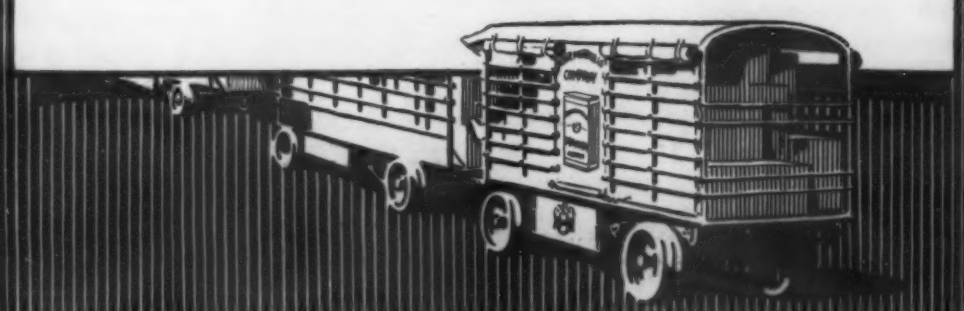
Six capacities: 750 lbs. to 5 tons

Catalogue 84 on request

General Vehicle Company, Inc.

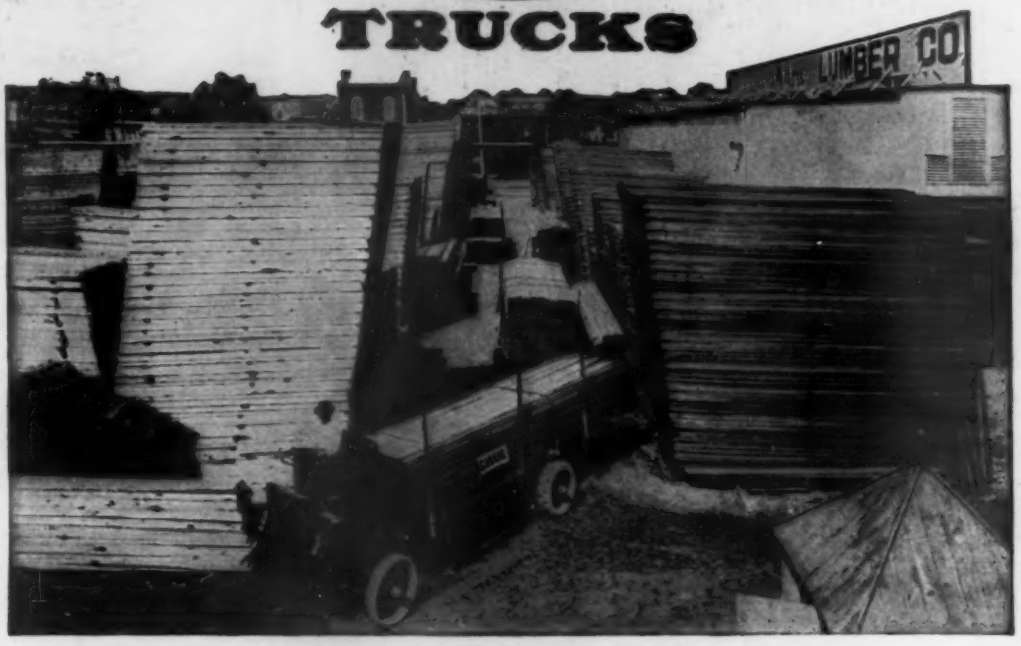
General Office and Factory: Long Island City, N. Y.

New York *Chicago* *Boston* *Philadelphia*



GMC

TRUCKS



IN no other class of business have GMC trucks done better work than in lumber haulage. Chasses for this service must be especially rugged, as it is often necessary to deliver heavy loads over rough roads to distant building operations

Lumber trucks must also have abundant power to carry them through soft "going" in lumber yards and in open lots, where deliveries are frequently made.

It has been the experience of owners of G M C lumber trucks in all parts of the country that their machines "stand up" under the hardest usage. Many concerns have not only cut the cost of their haulage but have developed new trade outside their former delivery zones.

The following is a partial list of G M C owners in the lumber trade:

Fidel-Ganahl Lumber Company	St. Louis, Mo.	Peshastin Lumber Company	Peshastin, Wash.
Boeckler Lumber Company	St. Louis, Mo.	F. A. York Company	Boston, Mass.
Pacific Sash and Door Company	Los Angeles, Cal.	Henry C. Stenton	Huntington, Mass.
Brett Lumber Company	Boston, Mass.	John L. Mitchell Lumber Company	Hull, Mass.
Hines Lumber Company	Chicago, Ill.	Interstate Lumber Company	Malden, Mass.
Badger Lumber Company	Kansas City, Mo.	E. B. Roberts	Boston, Mass.
C. W. Kopp	New York City	E. S. Decker Lumber Company	Greenfield, Mass.
Washburn-Todd Company	Ossining, N. Y.	William Curtis Sons' Company	Boston, Mass.
F. W. Herd Lumber Company	Detroit, Mich.	Concord Lumber Company	Atlanta, Ga.
Lowrie-Robinson Lumber Company	Detroit, Mich.	Perkins Woodworking Company	Boston, Mass.
William H. Wood Lumber Company	Cambridge, Mass.	Federal Sash & Door Company	Kansas City, Mo.
Dingledy Lumber Company	Youngstown, Ohio	W. A. C. Miller Company	Detroit, Mich.
Williams Lumber Company	Genoa, N. Y.	City Lumber Company	Detroit, Mich.

All GMC Trucks are backed by the largest manufacturers of motor-propelled vehicles in the world

GENERAL MOTORS TRUCK COMPANY

Pontiac **Michigan**

Makers of gasoline and electric trucks of all capacities

BRANCHES:—New York Boston Philadelphia Detroit Chicago Kansas City St. Louis

GMC

When Writing, Please Say—"Saw Your Ad. in the C C J"

Modern New Departure Facilities Guarantee Quality— Prompt Delivery—Service

¶ The success of the NEW DEPARTURE BALL BEARING has made it necessary to increase production facilities until we are now one of the largest makers of bearings in the world.

¶ Back of the big plant is an organization with an established reputation for the high quality of its product.

¶ New Departure Ball Bearings are guaranteed for durability of materials, accuracy of workmanship and fine finish.

¶ We are equipped in every particular for assisting you in solving your present and prospective bearing troubles, and for promptly delivering your orders.

¶ We maintain a co-operative engineering service that will fully and promptly give attention to your inquiries. Write us today.

The New Departure Manufacturing Co.

Bristol, Conn.

Western Branch, 1016-17 Ford Bldg., Detroit

When Writing, Please Say—"Saw Your Ad. in the C C J"

FEDERAL

Three years' continuous service proves correctness of original Federal design

SINCE the sale of the first Federal truck, three years ago, no radical changes have been made in the original Federal design.

Minor improvements and refinements have been made, but the Federal of today is almost identical with the first Federal of three years ago.

The first Federal sold is still being operated by its original owners and is averaging 75 miles per day, carrying capacity loads.

Its up-keep cost is exceptionally low and it compares most favorably in every respect with the Federals of today.

The fact that there are in operation more than 1000 Federal trucks of the original Federal design—demonstrates conclusively the scientific soundness of the original Federal design.

We have never had to rebuild or replace a Federal, nor have we received an unfavorable report on Federal quality and service from any one of the 1000 or more Federal owners.

Tabulated records of the hauls, comparative costs, repairs and savings of Federal trucks will be sent upon request.

Let us send you the Blue Book of Traffic.

Federal Motor Truck Co., *Dept. A.*, Detroit, Mich.

Willys Utility Truck

Three Quarter Ton *$1250 CHASSIS ONLY*

Reducing the high cost of gasoline motor trucks

IT has always been an acknowledged fact, in the industry, that the moment a truck was brought to a point where it could be thoroughly standardized and, in consequence, built in large quantities, the price would come down. For several years we have been developing and perfecting a truck that could be standardized, built in large quantities, and thus reduced in price.

The Willys Utility Truck is the final and practical result.

The chassis of this powerful and rugged truck is priced at $1250—which is from 30% to 50% lower than existing market prices of other similar trucks.

Big production brings down the price

This is due to big production. We are now producing commercial trucks in lots of ten thousand. This is the largest production of trucks ever attempted. We are duplicating our pleasure car production methods. And just as we have reduced pleasure car manufacturing costs, so have we reduced commercial truck costs by the application of quantity production methods.

Heretofore this plan of production would have been impractical. No truck was highly enough developed to be put on a basis of thorough standardization. What was new one day was old and obsolete the next. So no big production could be attempted by any one.

But circumstances have altered. The Willys Utility Truck is a proven standard and staple truck. In it are embodied everything that is practical and up to date.

All modern improvements

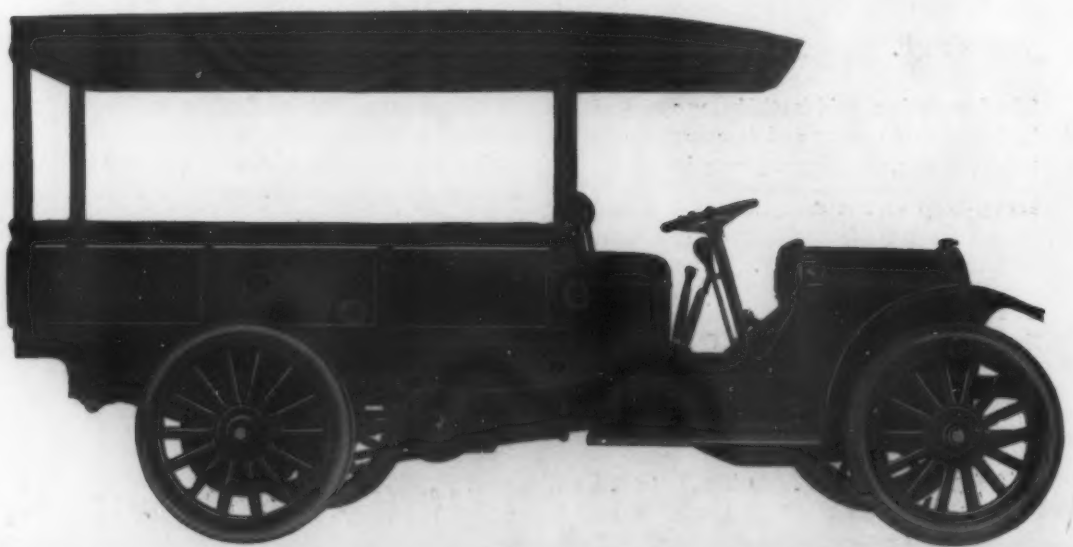
It has every modern truck improvement. The powerful 30 H. P. motor, for instance, is controlled by our patented governor. It cannot operate over 18 miles per hour. The pressed-steel frame is built to stand the most severe strains of heavy loads and the worst possible road conditions. It is thoroughly reinforced. Both the front and rear axles are unusually rugged, and are made in our drop forge plant. It has a three-speed transmission—three forward and one reverse. We found that 34 in. x 4½-in. pneumatic tires on the front wheels and 36 in. x 3½-in. solid tires on the rear give the most practical service, so we equipped the truck accordingly. It is a big, practical commercial truck—built purely and simply for commercial purposes.

Go to your nearest dealer. If there is none in your town, write us at once and you can deal direct with our factory.

Literature, advice and all information gratis.

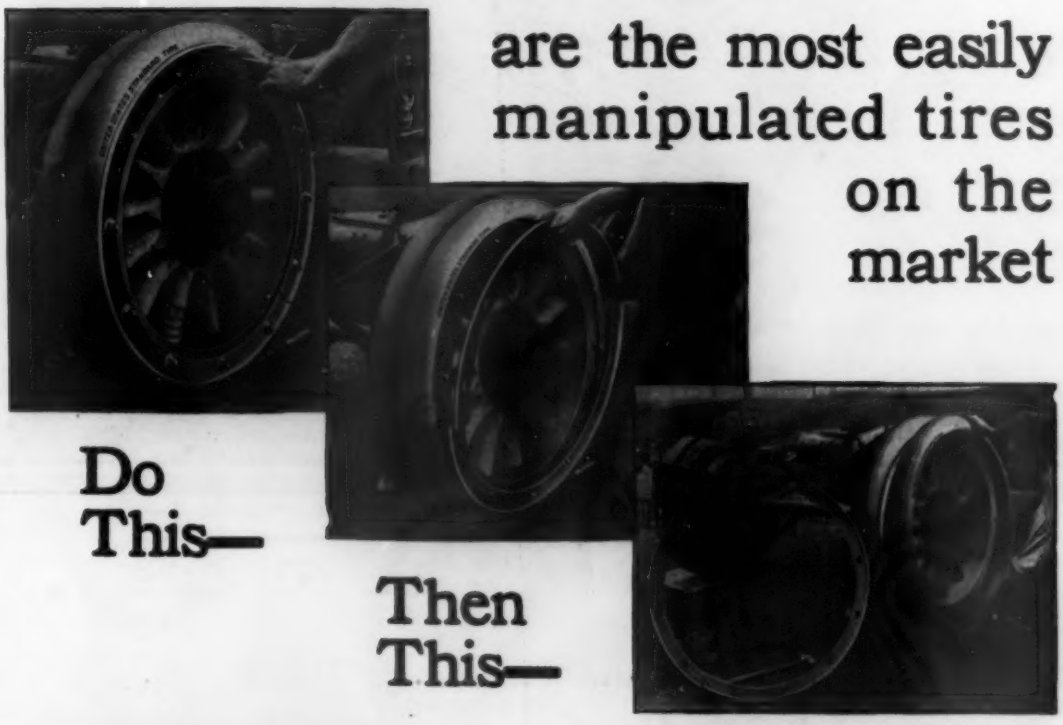
Please address Dept. 12

The Willys-Overland Company, Toledo, Ohio



United States Standard Motor Truck Tires

(Demountable)



are the most easily manipulated tires on the market

Do This—

Then This—

Then This—

and your Tire is off

Cross Section of the United States Standard Motor Truck Tire

Absolutely Guaranteed for 10,000 Miles

Conditional upon this mileage being used within one year

UNITED STATES TIRE COMPANY, New York

When Writing, Please Say—"Saw Your Ad. in the C C J"

Big Packers Endorse The Garford Truck

THE illustration above shows a two-ton Garford of the Sulzberger & Sons Company, wholesale meat dealers of New York, one of the dozens of our trucks in this service in the metropolis. It does the work of three two-horse teams and wagons, giving more prompt and reliable service than was ever possible under the old system. More than 5,000,000 people in New York depend on packers and wholesale butchers for their daily meat supply. Rapid transportation is the big essential with these consumers. The firms must handle their product promptly so that it will be in the best condition when it reaches the buyer.

The Garford motor truck has been found the ideal vehicle for meat delivery in New York and scores of other cities. It travels four times as fast as a horse and wagon outfit, and carries a much larger load than can be hauled on a wagon—and it does this work *twenty-four hours every day*, if necessary.

Tell us about your transportation problems. Our traffic experts have accurate data and figures on every industry. They will gladly tell you whether you can use a Garford to advantage.

Our descriptive catalogues and literature are free for the asking. Write today.

Please address Dept. 11.

The Garford Company, Elyria, Ohio

interest we can only hope that the law makers heeded the advice of those who are in the best position to understand just what such legislation would mean to a most important industry.

Kelly-Springfield Record.

Of historical interest to the American industry is the three-ton Kelly truck pictured on this page, which has traveled more than 21,000 miles and according to the owner is still going strong. This chassis contains one of the first water cooled engines built by the Kelly-Springfield Motor Truck Co., of Springfield, Ohio. Before it was sold to its present owner it was put through a strenuous factory and road test, aggregating 18,000 miles. It was then taken down and, the builders tell us, there was not the slightest sign of wear visible anywhere. The truck was then reassembled and sold to the Wagner Company, in whose service it has covered 3,000 miles more.

Ajax Not to Drop Mileage Guarantee.

In response to many inquiries the Ajax-Grieb Rubber Company recently announced.

A Kelly truck, which has made an excellent record for long distance traveling, having more than 21,000 miles to its credit. See note on this page.

THIS 3-ton Kelly Truck was driven 21,000 miles. 18,000 as a factory test car and then 3,000 miles in the hands of the present owners.

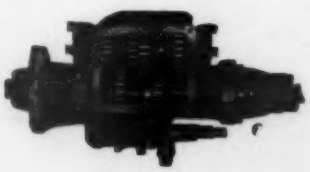
COVERT

A stock Model "K" Covert Transmission has taken the strains and stresses of this 21,000 miles of hard work.

In long hard service of this kind the transmission receives more strenuous usage than any other mechanical part of the car.

It certainly speaks well for the design, material and workmanship. The Covert Transmission has not shown any sign of wear in all this service.

This is only one instance of the service given by the thousands of Covert Transmissions in use today.



If your transmission equipment has caused you trouble, be on the safe and sure side. Covert Transmissions will end your worries.

Covert Motor Vehicle Company

Sales Office: Ford Building, Detroit, Mich.

Factory: Lockport, N. Y.

POLACK TYRES

CROSS SECTION

Do You Figure Cost Per Tyre or Cost Per Mile

SHORT-SIGHTED TRUCK OWNERS and MANUFACTURERS haggle over first cost. *The man who knows* bases his calculations on actual mileage.

That is why LARGE TRUCK OPERATORS use POLACK TYRES. The best Para Rubber in the compound and the 20% excess cushion on the tread combine to insure maximum resilience and wear.

POLACK TYRES always exceed their 10,000 mile guarantee and in many cases cover from 15,000 to 20,000 miles.

POLACK TYRES are 10 years ahead of the field in experience. They can not be equaled for service and prove the axiom that "the best costs less in the end."

"The Standard of Two Continents"

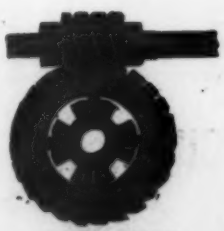
POLACK TYRE & RUBBER CO.

Principal Offices:
246 West 59th St., NEW YORK
Factory: Bridgeport, Conn.
Boston: 146 Summer Street
Philadelphia: 1003 Market Street
Chicago: 1344 Michigan Avenue
Detroit: Goldberg Building
St. Louis: 1813 Locust Street
Pittsburgh: First Ave. and Wood Street
Washington and Baltimore

INSURE TRUCK SERVICE

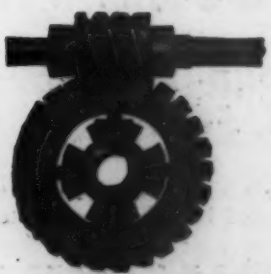
CRAMP

Gear Bronzes



1-TON GEAR

Metals look much alike. Before buying metals it is vitally important to consider the experience and reputation of the manufacturer, to know that the metals you use possess the qualities that will stand up in service and give the maximum of efficiency and wear.

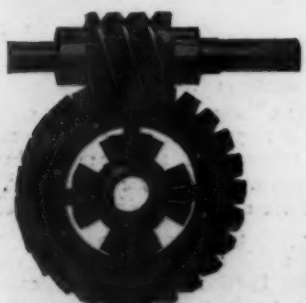


2-TON GEAR

Cramp's metals will give longer life—resist wear and abrasion better—will withstand excessive strain and shock and heavier starting torque than any other gearing metals. Through merit alone, Cramp's metals have achieved dominant place as the world's best metals.

It is no advantage to import metals, we manufacture absolutely the best and save you duty, freight and time.

The name CRAMP has for nearly a century set the highest standard in bearing metals. Cramp's metals are the result of almost a hundred years' experience. They have been used during these hundred years for worm drives for every type of machine, from turret turning gear to lifting bridges, elevators, marine railways, etc.



3-TON GEAR

5-TON GEAR

We furnish the metals and castings for Hindley Spiral Gears.

Write us—we can show you how Cramp's metals will better your products.

The William Cramp & Sons Ship & Engine Building Co.
PHILADELPHIA

When Writing, Please Say—"Saw Your Ad. in the C C J"

THE PALMER-MOORE

A Light Delivery Truck That's Good All Through

Capacity 1600 pounds
Price as shown, $1500.00

This truck is so simple, so reliable and made with such durable parts that any one with able body and sense enough to feed himself is qualified to operate and to maintain the mechanism perfectly.

This because we have simplified such complications as ordinarily require skilled attendance. One lever produces any engine speed, the gear shifts cannot be so thrown as to injure the transmission, and nothing about the engine is open to adjustment. The low engine speed makes air-cooling practical, lessens wear and vibration, and reduces lubrication to the mere addition of a quart of oil to every five gallons of gasoline put into the tank.

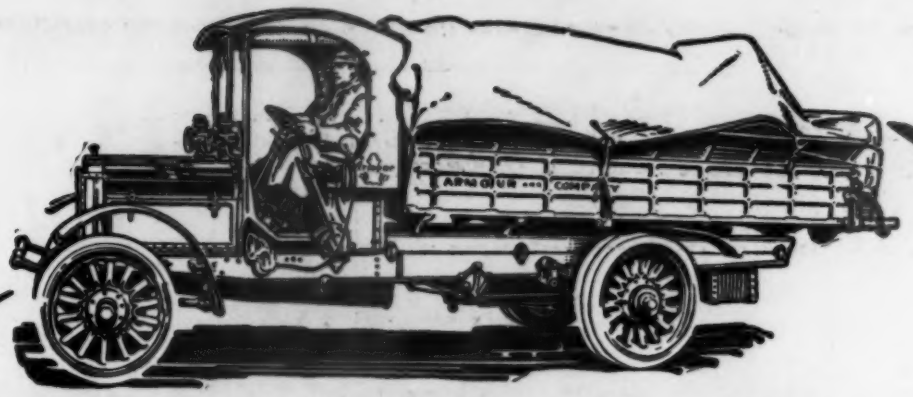
You would like this Palmer-Moore truck and its tire economy, for the use of solid tires guaranteed for 8,000 miles, saves at least 6 cents per mile over pneumatic tires. The cost of this truck per mile on an annual basis brings delivery expense to almost a negligible item.

And our fair treatment assures users the height of satisfaction.

Write for literature.

PALMER-MOORE COMPANY
SYRACUSE, N. Y.

(6)



Which truck tires are most efficient and economical?

When this question confronted Armour & Company they set about to solve it with characteristic thoroughness.

Equipping several trucks each with the tires of all leading makes they tested them out for more than a year under actual everyday working conditions. At the end of the test it was found that Goodrich Wireless Tires were still in condition to deliver three to four thousand more miles, when others were worn out. They were absolutely sound when others had destroyed themselves. As a result Armour & Company have adopted

GOODRICH WIRELESS DEMOUNTABLE TRUCK TIRES

for use on their motor trucks everywhere

Standardize your truck tires as Armour & Company have done

No matter how large or how small your business—you can be guided by the final judgment of Armour & Company—and settle the truck tire question once for all.

Let us put before you, in more detail, the results of Armour & Company's elimination test. Let us show you how you can save money and do your trucking more efficiently and at less cost, through the use of Goodrich Wireless Truck Tires.

Write us today for this valuable book—FREE

It cost us several thousand dollars to prepare this authentic book of reference. Each truck manufacturer furnished the data concerning his own truck. Photographs, specifications and the essential features are given of the 1913 models of nearly all the American-made motor trucks. Drop us a line on your business stationery for copy today.

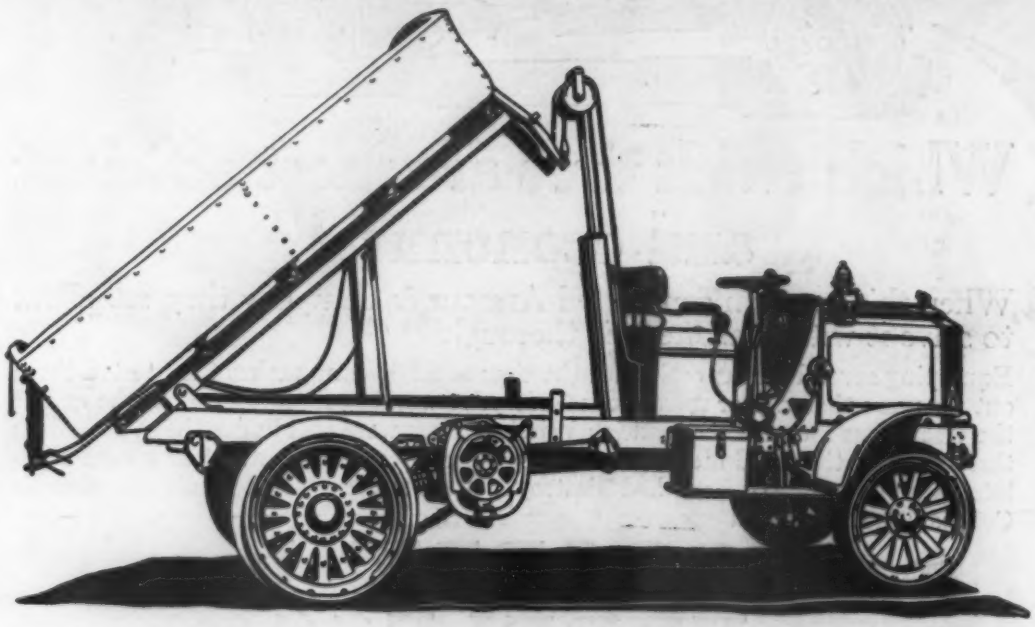
The B. F. Goodrich Company

Makers of Goodrich Tires and Everything That's Best in Rubber

Factories: Akron, Ohio **Branches in All Principal Cities**

There is nothing in Goodrich Advertising that isn't in Goodrich Goods

PACKARD DUMP BODY AND HYDRAULIC HOIST



¶ POSITIVE, SIMPLE AND ECONOMICAL IN OPERATION.

¶ CAN BE RAISED, LOWERED OR HELD AT ANY ANGLE WHEN TRUCK IS IN MOTION OR STATIONARY.

¶ MAXIMUM DUMP ANGLE—45 DEGREES—IS FIXED BY AUTOMATIC "FOOL-PROOF" STOP.

¶ EXTREMELY LOW HOIST PERMITS FREE PASSAGE UNDER LOW CHUTES.

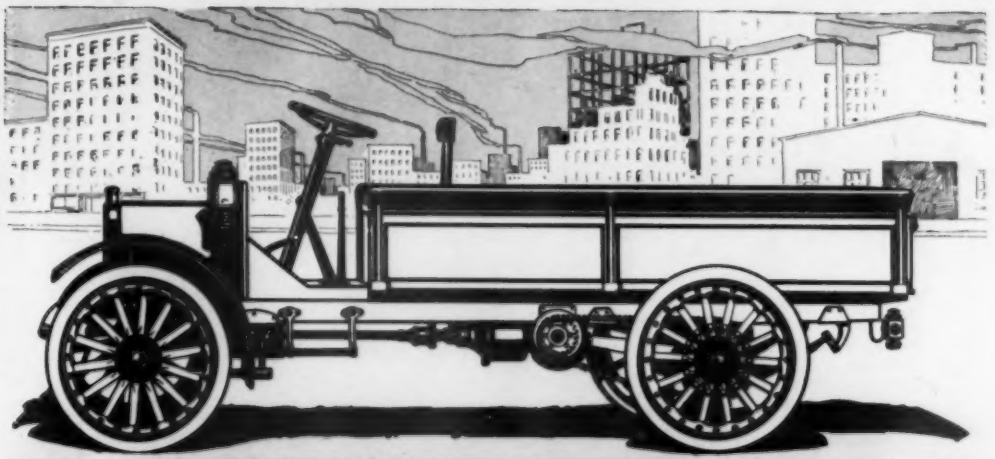
¶ THE PACKARD THREE-TON CHASSIS EQUIPPED WITH THIS ADVANCED TYPE OF DUMP BODY, $3,965; FIVE-TON CHASSIS WITH DUMP BODY, $5,080.

¶ When you purchase a Packard truck, Packard service is part of your investment.

Ask the man who owns one

Packard Motor Car Company, Detroit

Commercially Right : Commercially Right : Commercially Right : Commercially Right : Commercially Right : Commercially Right : Commercially Right : Commercially Right :



Express

2000 LBS.

Service

The MORA 24 is the **first** 4-cylinder wagon at a popular price built "Commercially Right" for Express Service. It's a wagon that saves money "coming and going"—in the purchase price and in the after expense for upkeep.

MORA

When we say "Commercially Right" we mean both from **usable** and **mechanical** standpoints. **Usable**—in that we appreciated the user's needs, such as practical loading space and convenient handling in congested places. **Mechanical**—because the mechanism will stand up under the work—designed right, of the right material and of the right proportions for the work.

Price

$1400

Chassis

Big Brother of a Wagon That Fully Satisfied Over 90% of Owners

THAT wasn't enough—so we went after the rest of that other 10%. The Model 24 will get it. It's an enlargement and refinement of the 90% Model 20. In this new MORA we have eliminated the majority of the troubles due to operators' carelessness and all of the few due to construction. Here's the way we went about it:—

First—Every complaint from owners was tabulated. These complaints were then thoroughly investigated so as to find out just where the cause lay and so steps could be taken to remove, as far as possible, a repetition on the Model 24.

Second—All repair tickets were closely examined for indications of weak spots where trouble had occurred which might be corrected.

Third—Our dealers were asked to "go to it" in criticising the Model 20 and suggesting improvements. In this way we not only developed Model 24 from the standpoint of service in one town, but built it so it will stand up and do the work **under all conditions in every section of the country.**

These are three big reasons why the MORA is "Commercially Right"—three big reasons why we can say that the MORA was built up to requirements and not down to a price.

This tells the story of **real** power vehicle **value.** The reason for this value at the un-meet-able (let alone unbeat-able) price of $1400 will follow in another ad. In the meantime, get further details. Get them NOW.

DEALERS:—The MORA's the livest proposition in the field today. The dealer who'll handle the MORA in your town will quickly have things his own way, for satisfied owners make sales easy. Value—Service—Price. You can't get away from it. You can be that dealer. Send for our proposition now and get started right.

The MORA POWER WAGON Co.

5326 St. Clair Avenue **Cleveland, Ohio**

Commercially Right : Commercially Right : Commercially Right : Commercially Right : Commercially Right : Commercially Right : Commercially Right : Commercially Right :

Is the Universal Motor Truck a Good Investment?

Absolutely.

Whether you are a prospective owner or dealer, it will pay you to go over carefully the construction of the Universal Motor Trucks.

They are the products of the largest factory in the country devoted exclusively to the manufacture of gasoline commercial vehicles.

They have been designed to meet particular conditions, incident to heavy trucking.

Every part is of a selected quality—of material which we have found by repeated tests to be the best for that particular part of the mechanism.

Universal trucks have plenty of speed and power, and are thoroughly reliable.

Accurate tests with all kinds of outfits, followed by a careful analysis of results have proved that Universal Motor Trucks furnish the logical and most economical solution of the trucking problem.

For long hauls especially, Universal two-ton and three-ton trucks are great money savers and money makers.

Universal Motor Trucks

They can be loaded and unloaded quickly.

The loading floor is nearer the ground than that of most trucks.

Universal Motor Trucks are displacing team outfits in all lines of business every day.

How Many Types Do You Build?

We build three chassis—

A one-ton worm-gear drive, which really has 1½ tons capacity and sells for $1950.

Price with Standard Express Body - - - - -	$2050	Two-ton chassis - - - - - - - - - - -	$2800
Price with Standard Stake Body - - - - - -	$2000	Three-ton chassis - - - - - - - - - - -	$3400

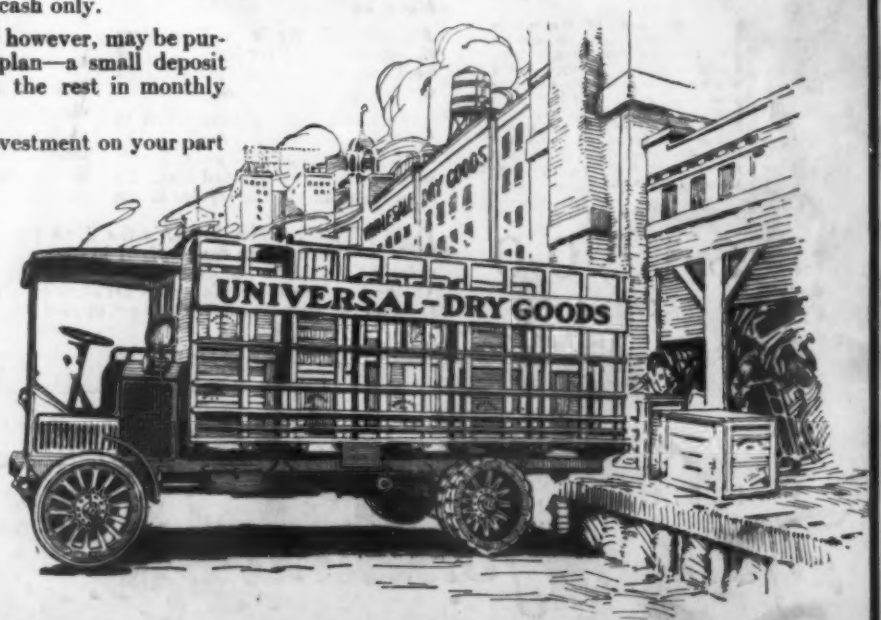
PRICES F. O. B. DETROIT

The one-ton truck is sold for cash only.

The two and three-ton trucks however, may be purchased on a special payment plan—a small deposit upon delivery of truck, and the rest in monthly payments.

Thus, it means but a small investment on your part to get the best truck on the market under exceedingly favorable conditions.

If you are a dealer, you will be interested in our special selling plan.



Universal Motor Truck Company

507 THEODORE STREET
DETROIT MICHIGAN

Fred K. Parke, General Manager